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Summary of phytoplankton data for the Nelson River and Rat-Burntwood lakes, 1989.

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Manitoba
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Fisheries



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ABSTRACT

During the 1989 field season, phytoplankton samples were collected from Rat, Threepoint, Cross, Sipiwesk, Split and Stephens. The phytoplankton was identified to species and biomass was calculated. The phytoplankton data collected from these lakes has been summarized and presented in the appendix of this report.

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INTRODUCTION

The 1989 data were compiled in conjunction with an ecological monitoring program under the auspices of Claim #18 of the Northern Flood Agreement. This study was initiated to assess the impact of the Churchill River diversion on the fish ecology of the northern lakes. It is necessary that all the monitored lakes have background information documented so that future comparisons can be made.

One aspect of ecological monitoring included the collection of phytoplankton samples from Rat, Threepoint, Cross, Sipiwesk, Split and Stephens lakes. Rat and Threepoint lakes, on the immediate Churchill River diversion route, are referred to as the diversion lakes. Cross and Sipiwesk, situated at the upper reaches of the Nelson, are referred to as the Upper Nelson. Split and Stephens lakes, situated near the middle reach of the Nelson, are referred to as the Middle Nelson.

The purpose of this report is to present the summarized phytoplankton data collected from the aforementioned lakes in 1989 in a form that will make it readily available for future reference.

METHODS AND MATERIALS

In 1989, phytoplankton samples were collected from all stations, May through September. Procedure for collection and preservation of samples was described in Livingston (1988).

The samples were sent to Department of Fisheries and Oceans, and analysed by D. Findlay. His methods were outlined in Livingston (1988).

RESULTS

Phytoplankton sampling locations in Rat, Threepoint, Cross, Sipiwesk, Split and Stephens are identified in Figures 2-7. Tables summarizing biomass and equivalent spherical diameter (ESD) values for the genera identified in each lake are found in Appendices A1-A6.

Most noteworthy for the 1989 field season are missing data from Cross and Sipiwesk lakes. As in 1988, Cross Lake station 3 was not sampled because of low water levels. The remainder of missing samples from Cross and Sipiwesk stations were a result of forest fire activity.

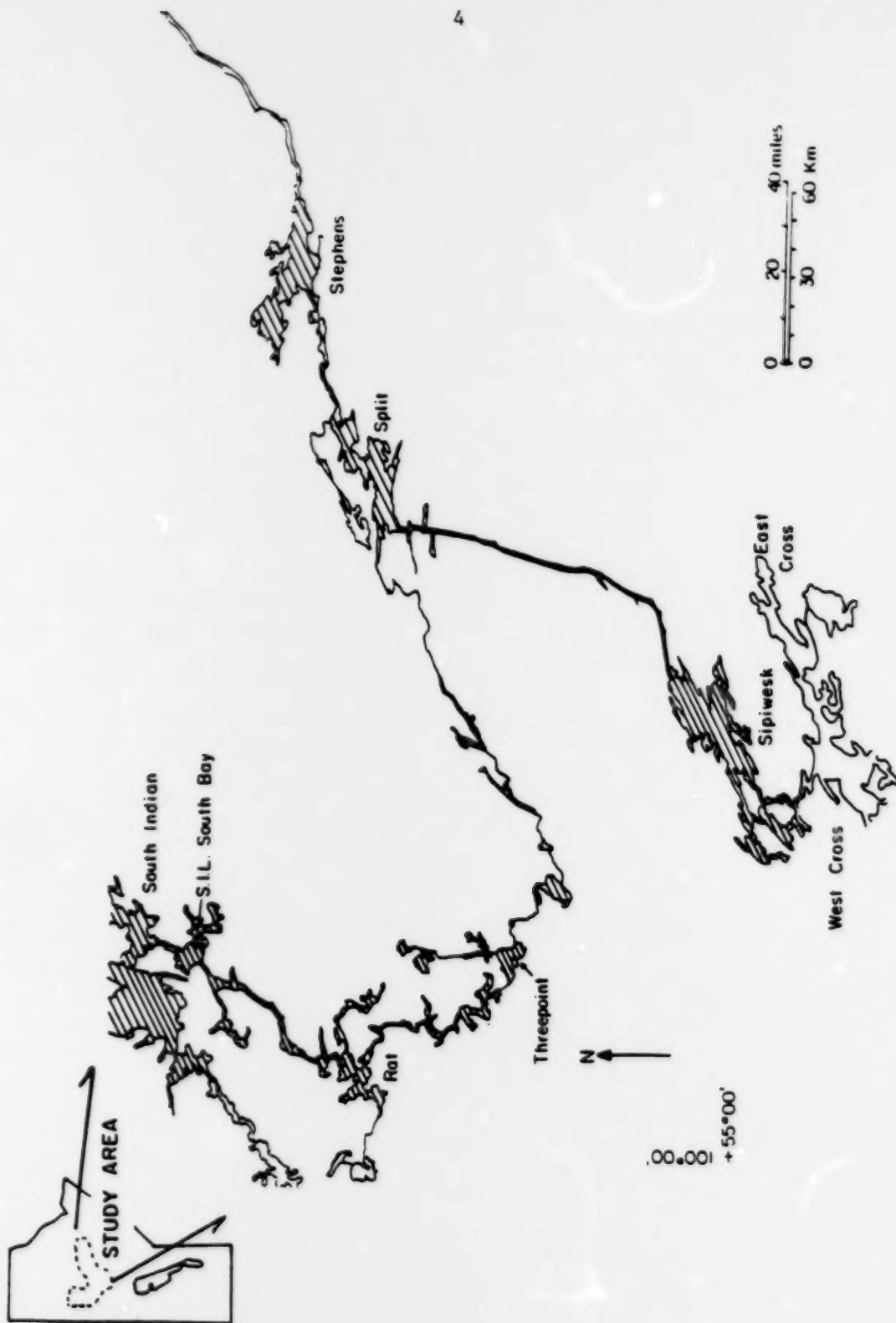


Fig. 1. Location of the six lakes sampled for phytoplankton, 1989.

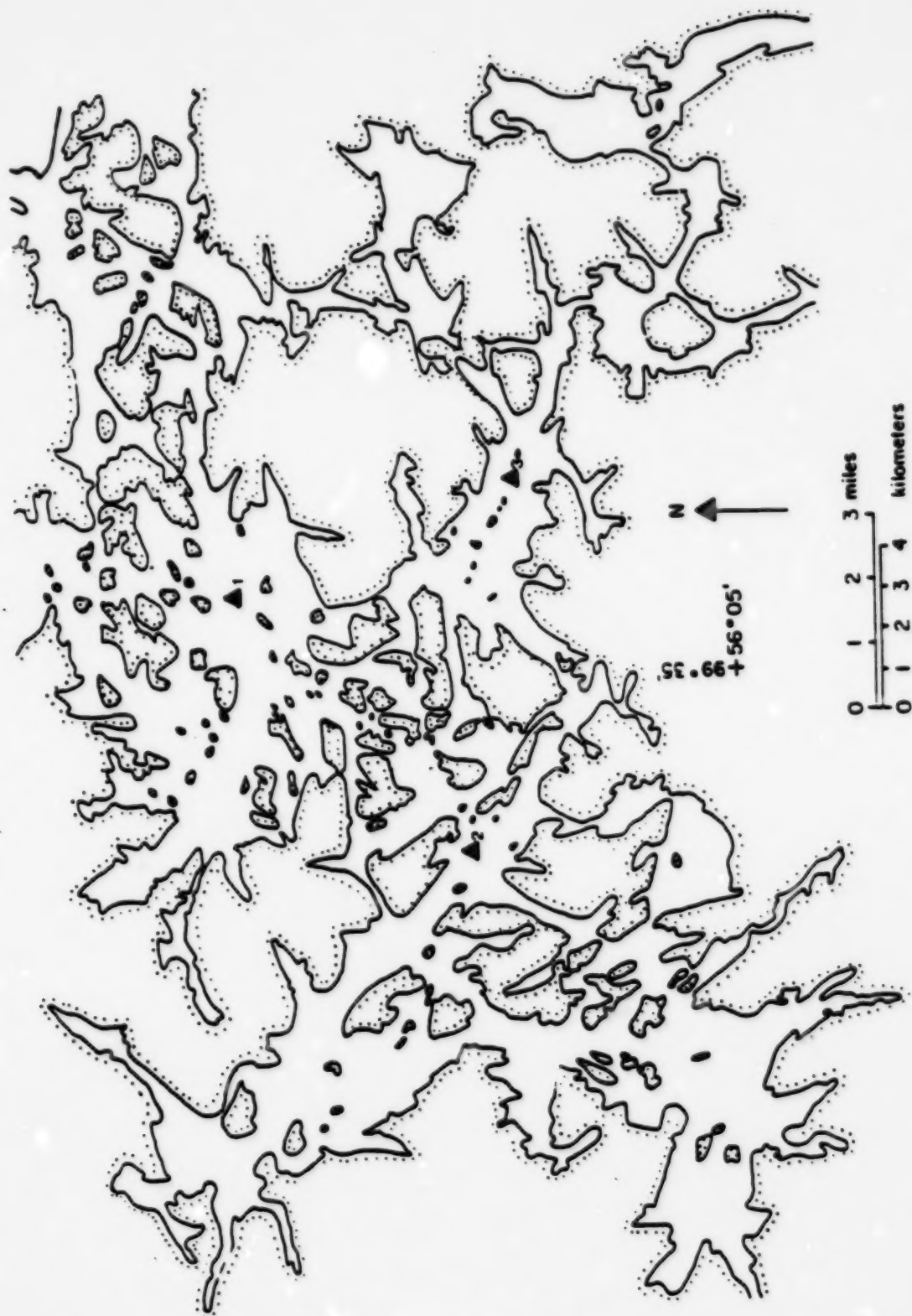


Fig. 2. Limnological sampling sites from Rat Lake, Manitoba, 1989.

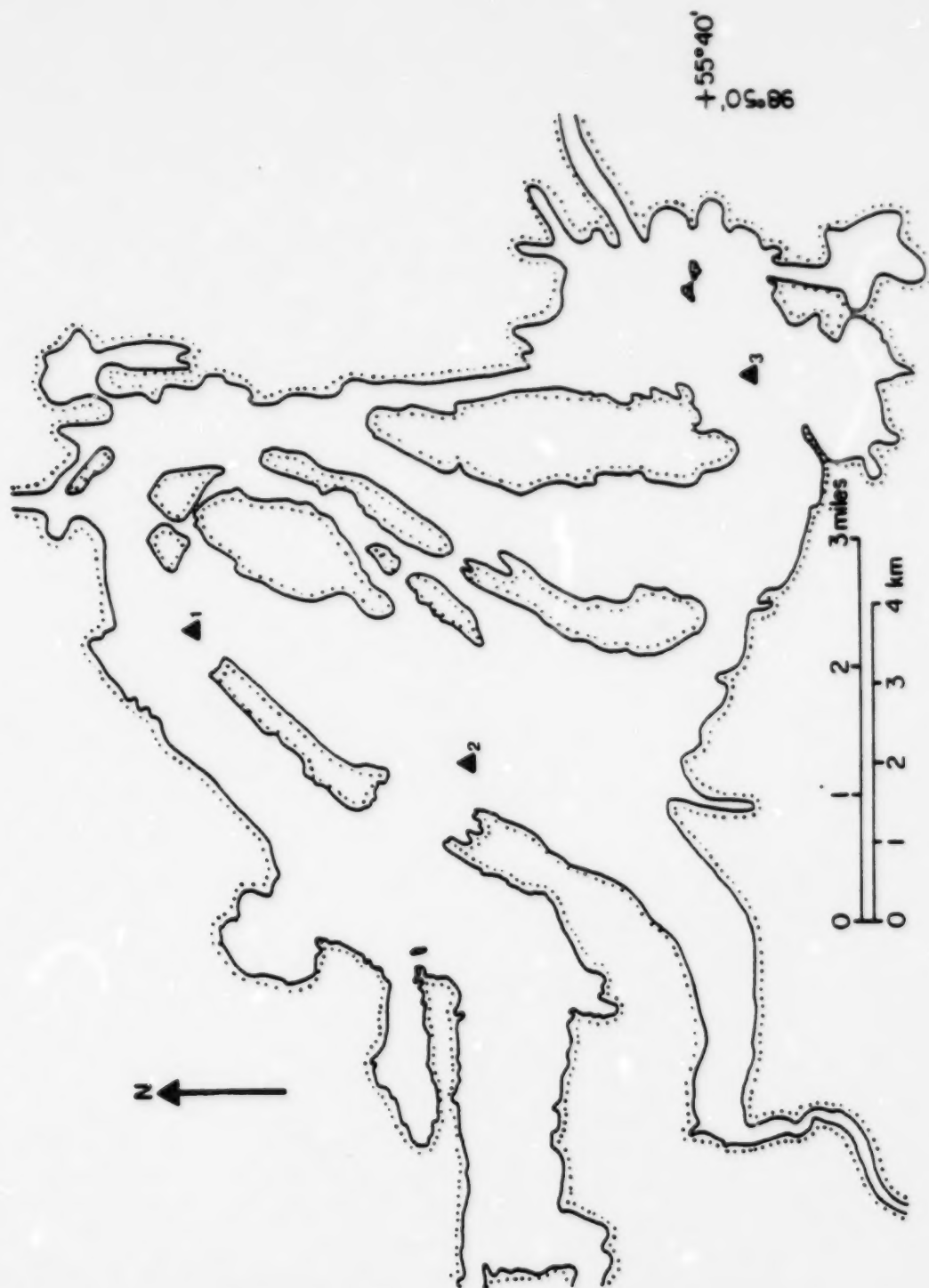


Fig. 3. Limnological sampling sites from Threepoint Lake, Manitoba, 1989.

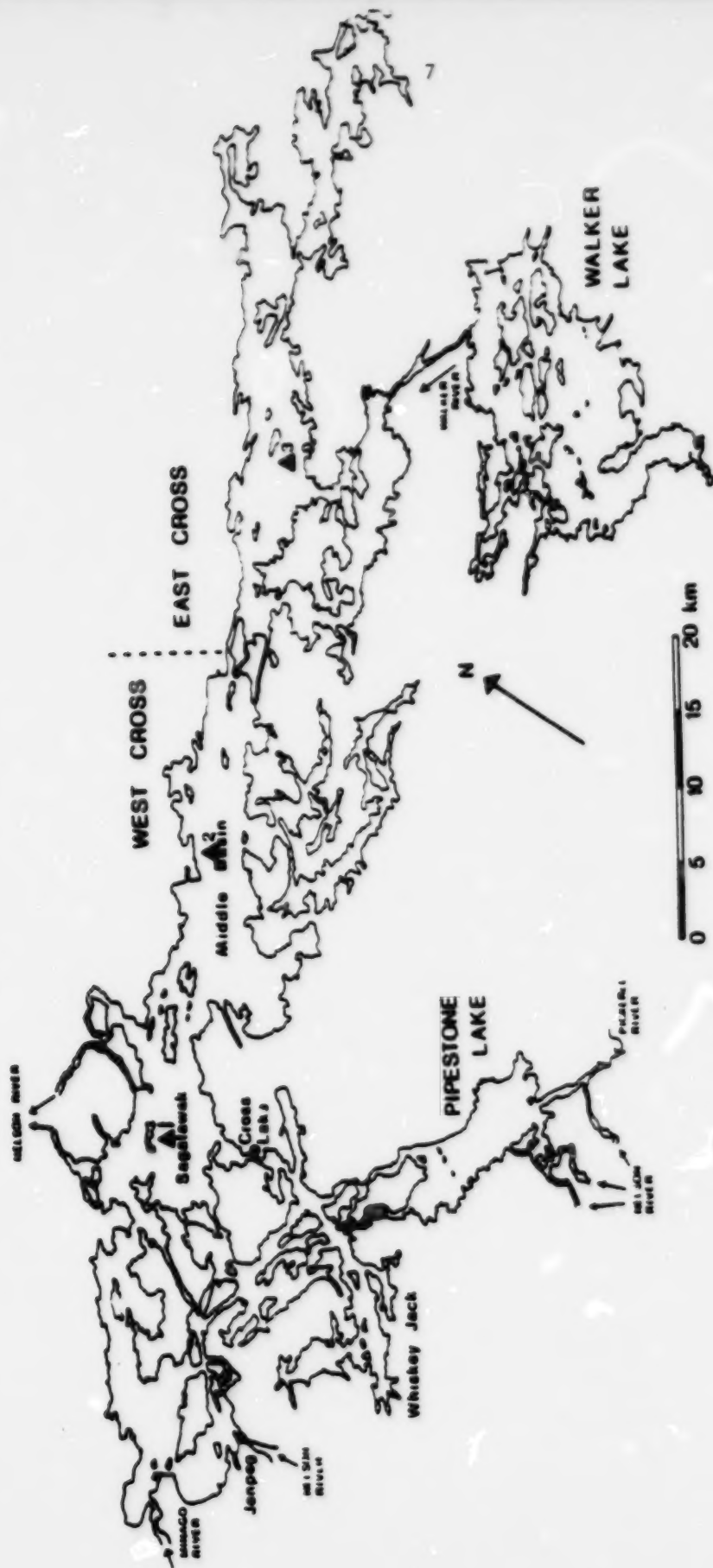


Fig. 4. Limnological sampling sites from Cross Lake, Manitoba, 1989.

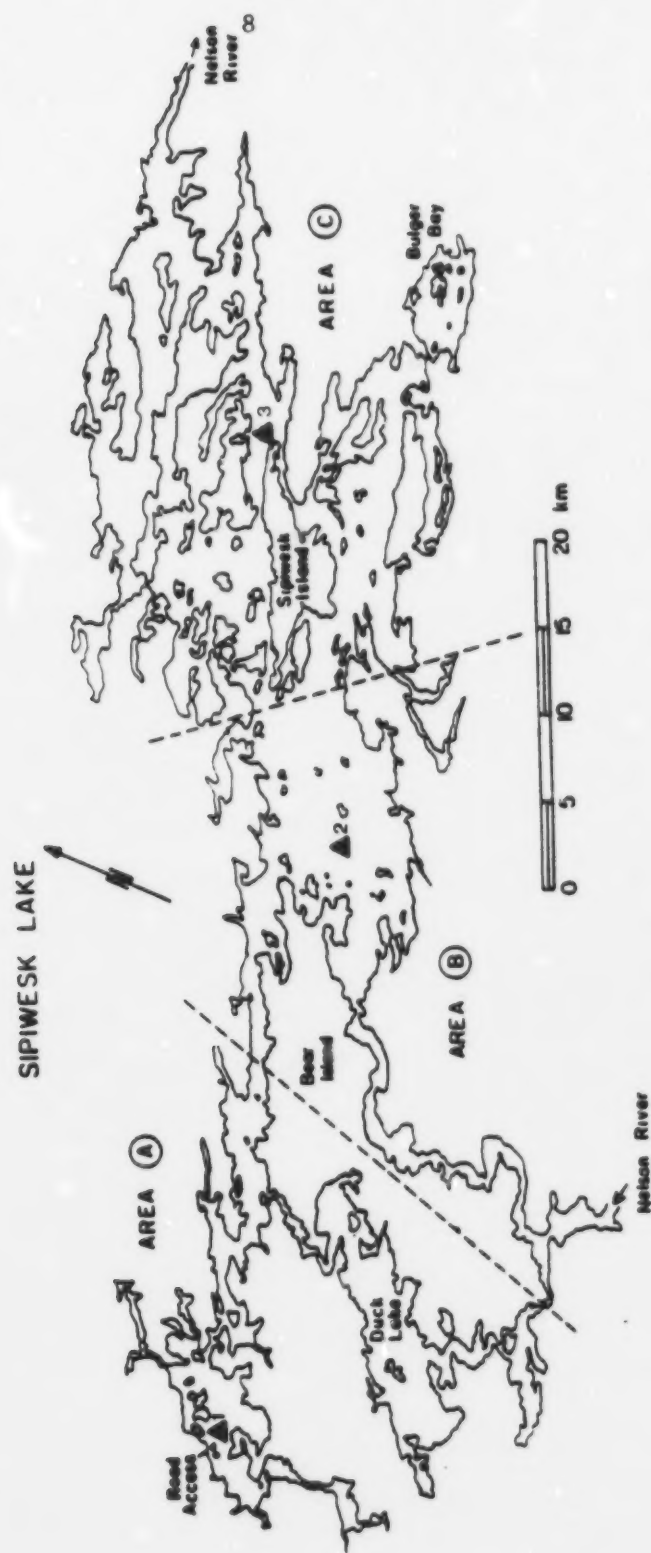


Fig. 5. Limnological sampling sites from Sipiwesk Lake, Manitoba, 1989.

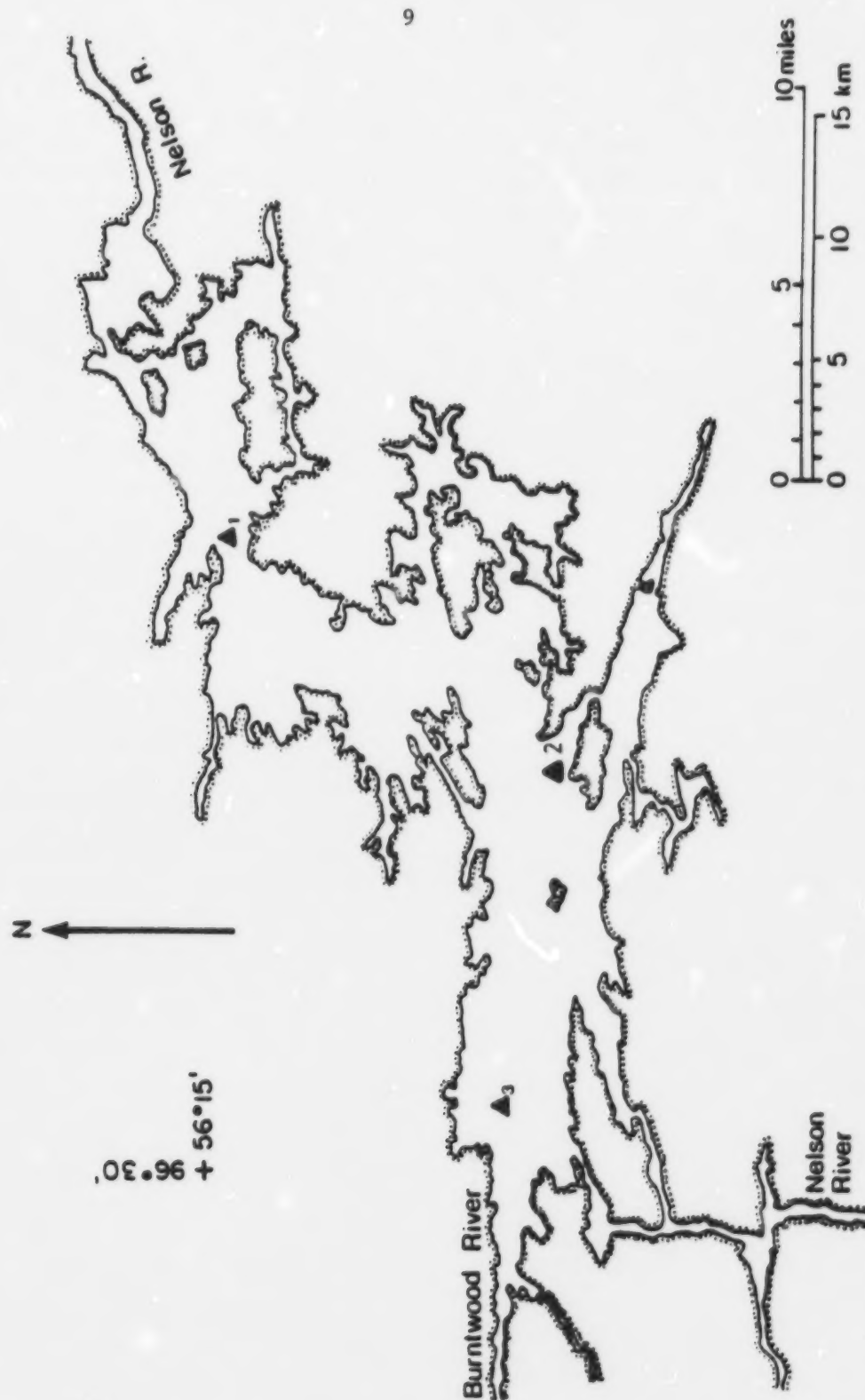


Fig. 6. Limnological sampling sites from Split Lake, Manitoba, 1989.

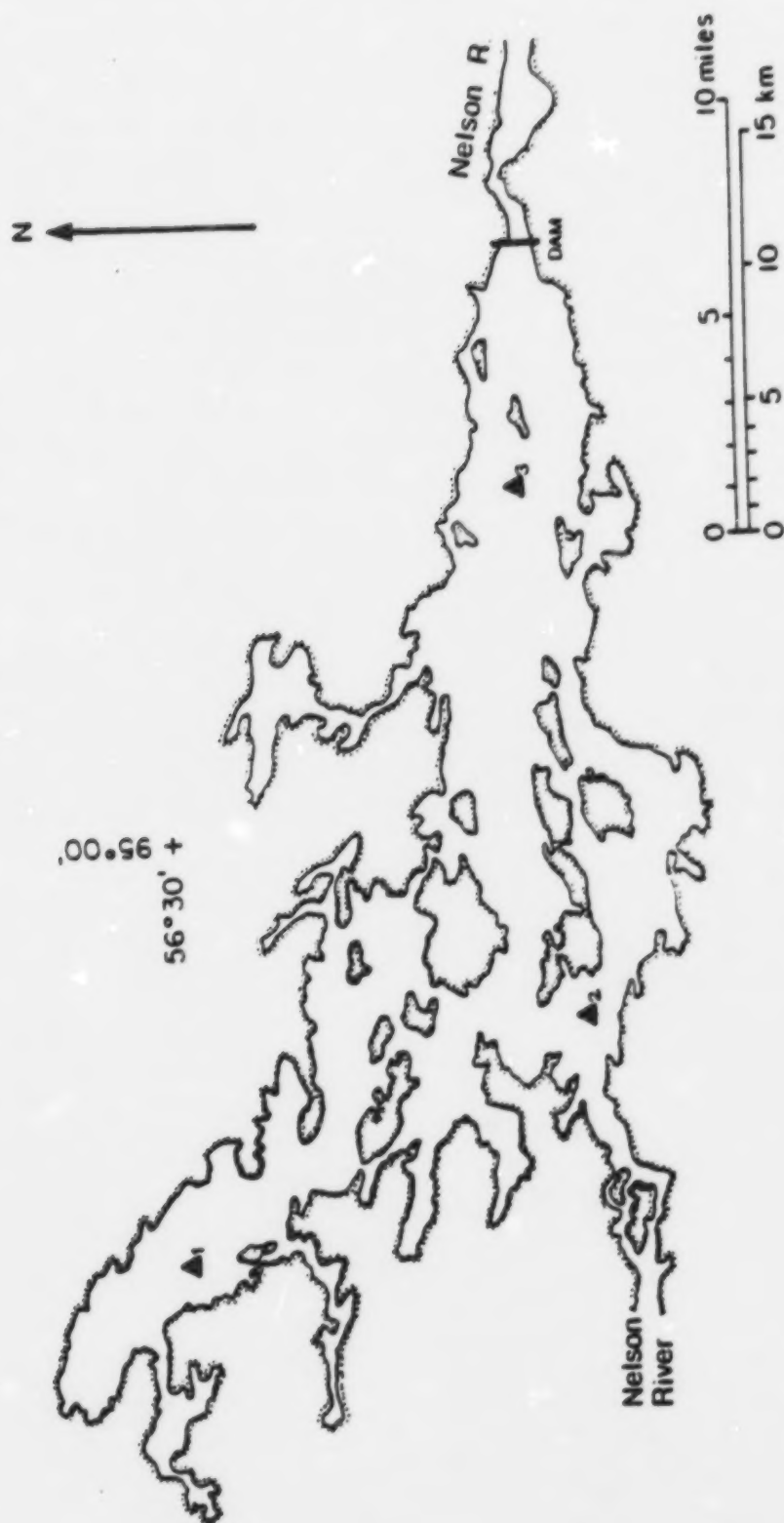


Fig. 7. Limnological sampling sites from Stephens Lake, Manitoba, 1989.

Appendix A1. Phytoplankton data from Rat Lake, 1989

Group

1. Cyanophyceae - bluegreen
2. Chlorophyceae - greens
3. Euglenophyceae - euglenophytes
4. Chrysophyceae - chrysophytes
5. Bacillario phyceae - diatoms
6. Cryptophyceae - cryptophytes
7. Peridineae - dinoflagellates

RAT LAKE May 25 1989

GENERA	BIOMASS (mg-m ⁻³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 1						
Anabaena	8.40		1.75	43.13		25.58
Aphanizomenon	2.01	1.26	0.50	13.39	13.39	13.39
Aphanocapsa						
Aphanothece						
Chroococcus		0.60			2.99	
Gomphospaeria						
Lyngbya	2.54			8.77		
Merismopedia						
Microcystis						
Oscillatoria						
Radiocystis						
Small bluegreens						
Synechococcus						
Marssonella						
Total	12.95	1.86	2.25	65.29	16.38	38.97
GROUP 2						
Ankistrodesmus						
Ankrya						
Arthrodesmus						
Botryococcus						
Carteria						
Chlamydomonas	7.30	6.10	1.87	12.00	22.25	10.54
Chodatella		0.36	0.36		4.57	4.57
Closterium						
Coelastrum						
Collodictyon						
Cosmarium						
Crucigeniella						
Dictyosphaerium	4.15	4.15	1.01	4.02	4.02	3.77
Elaktothrix						
Eudorina						
Gloeobotrys						
Kichnerella						
Monoraphidium	8.15	6.04	3.71	5.37	9.50	9.50
Mougeotia						
Oocystis		1.21	1.62		4.31	7.56
Paulschulzia						
Pediastrum						
Planctonema						
Pyramidomonas						
Quadrigula						
Scenedesmus			5.05			11.03
Schroederia						
Small greens		0.50			2.99	
Spirogrya						
Sponylosium						
Staurastrum						
Teilingia						
Tetraedon						
Westella						
Desmidium						
Scourfieldia						
Gyromitus	43.32	51.98	65.68	10.48	10.48	10.76
Chlorogonium			1.13			17.54
Total	62.92	70.34	80.43	31.87	58.12	75.27

GENERA	BIOMASS (mg-m ⁻³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 3						
Astasia						
Euglena	10.98	2.00	10.98	32.69	26.73	32.69
Trachelomonas	1.83	6.11	5.50	18.00	18.00	18.00
Phacus						
Total	12.81	8.11	16.48	50.69	44.73	50.69
GROUP 4						
Blascoeca						
Bitrichia						
Chrysochromulina	113.28	39.73	92.32	13.98	14.99	13.98
Chrysoikos						
Small Chrysophyceae	42.96	36.42	28.02	4.99	4.99	4.99
Large Chrysophyceae	10.34	8.21	5.47	7.01	8.99	8.99
Dinobryon						
Kephyrion						
Mallomonas						
Ochromonas						
Pteridomonas						
Salpingoeca	2.67	0.81	0.81	6.19	6.00	6.00
Spinifiromonas						
Stelemonas	4.05	3.38	4.05	5.64	5.64	5.64
Stichogloeca						
Synura	6.00	21.64	24.03	38.55	9.86	48.41
Uroglena						
Epiphyxis						
Total	179.30	110.19	154.70	76.36	50.47	88.01
GROUP 5						
Asterionella	9.17	7.26	4.61	15.84	15.67	15.67
Cyclotella	62.55	10.05	50.38	30.86	18.17	25.43
Diatoma						
small Diatoms						
large Diatoms						
Fragilaria						
Frustula						
Gyrosigma						
Melosira	2146.66	4346.70	3741.96	128.58	136.05	136.29
Navicula						
Nitzschia						
Rhizosolenia	53.81	12.93		14.20	7.26	
Stephanodiscus						
Surirella						
Synedra	2.55	3.59	3.89	8.70	23.07	22.80
Tabellaria	1.09		7.06	15.12		17.31
Stauroniscus						
Pennate Diatoms						
Total	2275.83	4380.53	3807.90	213.30	200.22	217.50
GROUP 6						
Cryptomonas	28.33	20.69	21.10	57.67	56.57	57.36
Katablepharis	4.31	15.80	10.78	5.76	5.76	5.76
Rhodomonas	212.20	204.33	207.60	14.41	14.41	14.41
Gonyostomum						
Total	244.84	240.82	239.48	77.84	76.74	77.53
GROUP 7						
Ceratium						
Gymnodinium	98.97	115.92	116.71	30.00	30.00	39.86
Peridinium	79.18	40.22	58.77	73.01	47.01	47.01
Total	178.15	156.14	175.48	103.01	77.01	86.87

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GENERA	BIOMASS (mg-m ⁻³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 1						
Anabaena						
Aphanizomenon						
Aphanocapsa						
Aphanothece						
Chroococcus						
Gomphospaeria						
Lyngbya	17.75	15.22	17.75	8.77	8.77	8.77
Merismopedia			1.61			4.75
Microcystis						
Oscillatoria						
Radiocystis						
Small bluegreens						
Synechococcus						
Marssonella						
Total	17.75	15.22	19.36	8.77	8.77	13.52
GROUP 2						
Ankistrodesmus						
Ankrya						
Arthrodesmus						
Botryococcus						
Carteria						
Chlamydomonas	0.31	0.31		4.35	4.35	
Chodatella	1.08			4.57		
Closterium						
Coelastrum						
Collodictyon						
Cosmarium						
Crucigeniella						
Dictyosphaerium	9.04	7.08	2.93	4.02	4.02	4.02
Elaktothrix						
Eudorina						
Gloeobotrys						
Kichnerella						
Monoraphidium	3.97	10.37	9.22	9.50	9.81	9.44
Mougeotia						
Oocystis						
Paulschulzia						
Pediastrum						
Planctonema						
Pyramidomonas						
Quadrigula						
Scenedesmus						
Schroederia						
Small greens	2.93			4.02		
Spirogrya						
Sponylosium						
Staurastrum						
Teilingia						
Tetraedon						
Westella						
Desmidium						
Scourfieldia						
Gyromitus	5.05	30.32		11.03	10.48	
Chlorogonium						
Total	22.38	48.08	12.15	37.49	28.66	13.46

GENERA	BIOMASS (mg-m ³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 3						
Astasia						
Euglena						
Trachelomonas	2.44	2.44	1.83	18.00	18.00	18.00
Phacus						
Total	2.44	2.44	1.83	18.00	18.00	18.00
GROUP 4						
Biocoea						
Bitrichia						
Chrysochromulina	69.14	119.54	125.69	12.02	4.99	13.98
Chrysoikos		0.45			4.94	
Small Chrysophyceae	17.74	26.15	19.15	4.99	4.99	4.99
Large Chrysophyceae	2.59	5.47	6.47	7.01	8.99	7.01
Dinobryon						
Kephyrion						
Mallomonas	1.09			17.31		
Ochromonas						
Pteridomonas						
Salpingoeca	2.44			6.00		
Spinifiromonas						
Stelemonas	22.28	22.96	24.99	5.64	5.64	5.64
Stichogloeca						
Synura	12.00	3.61	6.00	38.55	9.86	38.55
Uroglena	4.06			6.00		
Epiphyxis						
Total	131.34	178.18	182.30	97.52	39.41	70.17
GROUP 5						
Asterionella	29.09	28.57	28.40	15.02	15.53	15.32
Cyclotella	13.00	10.50	4.13	29.07	25.43	25.43
Diatoma						
small Diatoms						
large Diatoms						
Fragilaria						
Frustula						
Gyrosigma						
Melosira	587.14	462.24	839.97	123.46	127.09	125.75
Navicula						
Nitzschia						
Rhizosolenia	49.96	49.96	74.00	13.03	13.03	15.79
Stephanodiscus		3.05			30.78	
Surirella						
Synedra	3.38	2.04	4.19	22.80	23.08	23.08
Tabellaria		2.81	1.13		17.52	17.52
Stauroniscus						
Pennate Diatoms						
Total	682.57	559.17	951.82	203.38	252.46	222.89
GROUP 6						
Cryptomonas	6.11	11.00	25.33	57.36	57.36	56.07
Katablepharis	8.62	13.65	12.21	5.76	5.76	5.76
Rhodomonas	133.11	199.17	183.81	14.41	14.41	14.41
Gonyostomum						
Total	147.84	223.82	221.35	77.53	77.53	76.24
GROUP 7						
Ceratium						
Gymnodinium	28.27	33.93	22.62	30.00	70.72	30.00
Peridinium	5.43	21.72	10.86	29.59	29.59	29.59
Total	33.70	55.65	33.48	59.59	100.31	59.59

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GENERA	BIOMASS (mg-m ³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 1						
Anabaena	16.50	6.33	9.08	54.01	62.26	69.80
Aphanizomenon	0.75		1.51	13.39		13.39
Aphanocapsa						
Aphanothece						
Chroococcus						
Gomphospaeria	1.94			21.00		
Lyngbya	13.53	58.65	17.75	10.62	10.62	8.77
Merismopedia						
Microcystis						
Oscillatoria						
Radiocystis						
Small bluegreens						
Synechococcus						
Marssoniiella						
Total	32.72	64.98	28.34	99.02	72.88	91.96
GROUP 2						
Ankistrodesmus			5.14			6.99
Ankrya						
Arthrodesmus						
Botryococcus			4.89			36.00
Carteria						
Chlamydomonas		8.90	5.40		19.03	15.57
Chodatella			0.36			4.57
Closterium						
Coelastrum						
Collodictyon						
Cosmarium						
Crucigeniella			0.36			4.57
Dictyosphaerium		1.22			4.02	
Elaktothrix		0.82			4.17	
Eudorina						
Gloeobotrys						
Kichnerella						
Monoraphidium	2.89	5.79	5.90	9.79	9.12	9.85
Mougeotia			0.40			15.65
Oocystis	1.24			4.35		
Paulschulzia						
Pediastrum	7.76			42.00		
Planctonema						
Pyramidomonas						
Quadrigula						
Scenedesmus		5.68			9.10	
Schroederia						
Small greens						
Spirogrya						
Sponylosium						
Staurostrum						
Teilingia						
Tetraedon						
Westella						
Desmidium						
Scourfieldia						
Gyromitus		4.33			10.48	
Chlorogonium						
Total	11.89	26.74	22.45	56.14	55.92	93.20

GENERA	BIOMASS (mg-m ³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 3						
Astasia						
Euglena	15.76	0.75	2.05	26.60	12.15	26.95
Trachelomonas	0.61	20.76	1.83	18.00	18.00	18.00
Phacus						
Total	16.37	21.51	3.88	44.60	30.15	44.95
GROUP 4						
Biocoeca		0.81	1.62		6.00	6.00
Bitrichia						
Chrysochromulina	99.21	58.84	82.33	13.98	4.99	13.98
Chrysoikos						
Small Chrysophyceae	9.81	38.29	29.42	4.99	4.99	4.99
Large Chrysophyceae	46.53	21.18	15.40	8.99	8.00	8.00
Dinobryon	50.28	32.77	25.38	28.65	56.33	25.73
Kephyrion			0.20			2.99
Mallomonas	1.05		0.54	21.53		17.31
Ochromonas						
Pteridomonas						
Salpingoeca						
Spinifiromonas			1.93			8.00
Stelxmonas	5.03	2.70	4.73	5.76	5.64	5.64
Stichogloeca						
Synura	3.61		14.43	9.86		9.86
Uroglena	9.05	11.37	12.93	7.01	6.00	7.01
Epiphyxis						
Total	224.57	165.96	188.91	100.77	91.95	109.51
GROUP 5						
Asterionella	8.43	2.12	13.78	15.68	15.44	15.47
Cyclotella	6.28	3.77	14.36	18.17	18.17	25.43
Diatoma						
small Diatoms						
large Diatoms						
Fragilaria						
Frustula						
Gyrosigma						
Melosira	134.57	523.86	808.30	115.64	124.53	128.17
Navicula						
Nitzschia						
Rhizosolenia	49.96		41.63	13.03		13.03
Stephanodiscus						
Surirella						
Synedra	5.42	5.90	5.87	23.07	23.07	23.07
Tabellaria	1.09	9.50	0.51	17.31	18.22	16.98
Stauronites						
Pennate Diatoms						
Total	205.75	545.15	884.45	202.90	199.43	222.15
GROUP 6						
Cryptomonas	21.85	121.09	58.04	57.36	57.36	57.82
Katablepharis	17.24	13.65	2.87	5.76	5.76	5.76
Rhodomonas	98.60	193.99	196.27	14.41	14.41	14.41
Gonyostomum						
Total	137.69	328.73	257.18	77.53	77.53	77.99
GROUP 7						
Ceratium						
Gymnodinium	7.21	25.33	16.96	40.99	74.72	30.00
Peridinium	0.25	4.68	0.55	13.30	46.35	17.42
Total	7.46	30.01	17.51	54.29	121.07	47.42

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GENERA	BIOMASS (mg-m ³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 1						
Anabaena	63.82	213.50	116.55	104.08	81.39	91.38
Aphanizomenon	20.61	114.16	5.53	62.38	106.02	13.39
Aphanocapsa						
Aphanothece						
Chroococcus						
Gomphospaeria						
Lyngbya	2.54	2.54	2.54	8.77	8.77	8.77
Merismopedia						
Microcystis						
Oscillatoria	7.94			42.33		
Radiocystis						
Small bluegreens						
Synechococcus						
Marssonella						
Total	94.91	330.20	124.62	217.56	196.18	113.54
GROUP 2						
Ankistrodesmus						
Ankrya						
Arthrodesmus						
Botryococcus						
Carteria						
Chlamydomonas	0.50	3.61	4.33	7.74	17.78	10.48
Chodatella						
Closterium	0.08		0.08	9.10		9.10
Coelastrum						
Collodictyon						
Cosmarium						
Crucigeniella		1.22			6.87	
Dictyosphaerium		8.53			3.98	
Elaktothrix		0.27			4.17	
Eudorina						
Gloeobotrys						
Kichnerella						
Monoraphidium	1.43	1.78	0.58	9.50	3.90	5.37
Mougeotia						
Oocystis	4.87			7.56		
Paulschulzia		6.58			12.05	
Pediastrum			10.87			47.00
Planctonema						
Pyramidomonas						
Quadrigula						
Scenedesmus	2.84		3.61	9.10		9.86
Schroederia						
Small greens			0.30			2.99
Spirogrya						
Sponylosium						
Staurastrum						
Teilingia						
Tetraedon						
Westella						
Desmidium						
Scourfieldia						
Gyromitus	75.76	217.17	45.45	11.03	11.03	11.03
Chlorogonium						
Gloeococcus		2.41			8.62	
Total	85.48	241.57	65.22	54.03	68.40	95.83

GENERA	BIOMASS (mg-m ⁻³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 3						
Astasia						
Euglena						
Trachelomonas	3.05	4.27	4.27	18.00	18.00	18.00
Phacus						
Total	3.05	4.27	4.27	18.00	18.00	18.00
GROUP 4						
Biocoeca	3.55			14.99		
Bitrichia						
Chrysochromulina	67.77	77.63	43.70	14.99	14.99	13.98
Chrysoikos						
Small Chrysophyceae	22.88	21.01	16.34	4.99	4.99	4.99
Large Chrysophyceae	5.78	5.47	10.34	8.00	8.99	7.01
Dinobryon		3.95			8.07	
Kephyrion		0.81			6.00	
Mallomonas	18.68	28.18	35.92	38.42	39.26	39.26
Ochromonas						
Pteridomonas						
Salpingoeca	4.06	4.87		6.00	6.00	
Spinifiromonas						
Stelemonas		1.35			5.64	
Stichogloeca						
Synura	4.33		7.21	10.48		9.86
Uroglena	6.47			7.01		
Epiphyxis						
Total	133.52	143.27	113.51	104.88	93.94	75.10
GROUP 5						
Asterionella	1.31	5.79	3.65	15.47	15.35	15.10
Cyclotella	7.44	5.57	2.51	29.60	25.43	18.17
Diatoma						
small Diatoms						
large Diatoms						
Fragilaria						
Frustula						
Gyrosigma						
Melosira	6.23	47.50	40.75	30.99	73.17	76.37
Navicula						
Nitzschia						
Rhizosolenia	16.65	6.49		13.03	12.00	
Stephanodiscus						
Surirella						
Synedra	1.86	1.41	0.90	8.70	23.07	8.70
Tabellaria		3.02			16.87	
Stauroniscus						
Pennate Diatoms						
Total	33.49	69.78	47.81	97.79	165.89	118.34
GROUP 6						
Cryptomonas	92.66	429.89	258.36	56.16	55.66	57.36
Katablepharis	15.80	35.20	12.21	5.76	5.76	5.76
Rhodomonas	160.77	532.74	168.68	14.41	14.41	14.41
Gonyostomum						
Total	269.23	997.83	439.25	76.33	75.83	77.53
GROUP 7						
Ceratium		8.77	11.93		43.74	48.48
Gymnodinium		44.61	10.29		32.00	32.00
Peridinium	8.14	2.46	1.11	29.59	16.76	17.42
Total	8.14	55.84	23.33	29.59	92.50	97.90

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GENERA	BIOMASS (mg-m ³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 1						
Anabaena	13.35	20.07	5.16	66.04	33.72	58.13
Aphanizomenon	6.28	107.56	2.26	13.39	62.38	13.39
Aphanocapsa						
Aphanothece						
Chroococcus						
Gomphospaeria						
Lyngbya	5.07	5.07	10.14	8.77	8.77	8.77
Merismopedia						
Microcystis						
Oscillatoria						
Radiocystis						
Small bluegreens						
Synechococcus						
Marssoniella						
Total	24.70	132.70	17.56	88.20	104.87	80.29
GROUP 2						
Ankistrodesmus	3.10			5.91		
Ankrya						
Arthrodesmus						
Botryococcus						
Carteria	10.32			14.00		
Chlamydomonas	8.09	9.99	10.44	17.39	18.46	14.00
Chodatella						
Closterium	0.40	1.19	0.95	9.10	9.10	9.10
Coelastrum		0.61			17.99	
Collodictyon						
Cosmarium						
Crucigeniella	0.36			4.57		
Dictyosphaerium	10.75			4.02		
Elaktothrix						
Eudorina						
Gloeobotrys						
Kichnerella		3.25			6.00	
Monoraphidium	4.33	5.83	2.09	9.58	10.10	9.69
Mougeotia						
Oocystis						
Paulschulzia						
Pediastrum	7.76	21.65	7.22	42.00	41.00	41.00
Planctonema						
Pyramidomonas						
Quadrigula						
Scenedesmus						
Schroederia						
Small greens			5.37			4.02
Spirogrya						
Sponylosium						
Staurostrum						
Teilingia						
Tetraedon						
Westella						
Desmidium						
Scourfieldia						
Gyromitus	30.30	73.64	38.99	11.03	10.48	10.48
Chlorogonium						
Gloeococcus	3.76			10.00		
Total	79.17	116.16	65.06	127.60	113.13	88.29

GENERA	BIOMASS (mg-m ³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 3						
Astasia					28.30	
Euglena		2.37				
Trachelomonas	1.22	1.22	4.88	18.00	18.00	18.00
Phacus						
Total	1.22	3.59	4.88	18.00	46.30	18.00
GROUP 4						
Biocoeca	7.30	5.18		12.00	14.00	
Bitrichia						
Chrysochromulina	59.77	86.88	42.49	4.99	14.99	4.99
Chrysoikos						
Small Chrysophyceae	29.42	15.88	29.42	4.99	4.99	4.99
Large Chrysophyceae	19.25	6.16	38.32	8.00	8.17	8.99
Dinobryon						
Kephyrion						
Mallomonas	3.86	8.75	9.08	39.31	39.26	47.31
Ochromonas						
Pteridomonas						
Salpingoeca	3.25	3.88	12.07	6.00	7.01	14.00
Spinifiromonas			8.21			8.99
Stelxmonas	10.78	2.03	10.13	5.76	5.64	5.64
Stichogloecca						
Synura	18.00	3.61		38.55	9.86	
Uroglena						
Epiphyxis						
Total	151.63	132.37	149.72	119.60	103.92	94.91
GROUP 5						
Asterionella	1.86	1.36	0.72	15.32	15.49	7.27
Cyclotella	36.09	96.02	65.79	25.43	68.25	27.25
Diatoma						
small Diatoms						
large Diatoms						
Fragilaria						
Frustula						
Gyrosigma						
Melosira	178.44	118.27	80.88	76.51	79.70	76.62
Navicula						
Nitzschia						
Rhizosolenia	25.58		0.54	13.14		5.23
Stephanodiscus		3.66			32.71	
Surirella						
Synedra	0.83	2.59	1.04	8.70	23.07	8.70
Tabellaria	3.44	6.88		17.62	17.62	
Stauronies						
Pennate Diatoms						
Total	246.24	228.78	148.97	156.72	236.84	125.07
GROUP 6						
Cryptomonas	286.07	261.83	222.56	57.36	56.57	57.36
Katablepharis	12.21	10.06	10.06	5.76	5.76	5.76
Rhodomonas	202.33	229.31	238.14	14.41	14.41	14.41
Gonyostomon						
Total	500.61	501.20	470.76	77.53	76.74	77.53
GROUP 7						
Ceratium		10.18	9.05		45.98	44.21
Gymnodinium		20.09	12.89		82.65	77.74
Peridinium	1.48	2.22	0.55	16.76	17.42	17.42
Total	1.48	32.49	22.49	16.76	146.05	139.37

Appendix A2. Phytoplankton data from Threepoint Lake, 1989

Group

1. Cyanophyceae - bluegreen
2. Chlorophyceae - greens
3. Euglenophyceae - euglenophytes
4. Chrysophyceae - chrysophytes
5. Bacillario phyceae - diatoms
6. Cryptophyceae - cryptophytes
7. Peridineae - dinoflagellates

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GENERA	BIOMASS (mg-m ⁻³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 1						
Anabaena						
Aphanizomenon						
Aphanocapsa						
Aphanothece						
Chroococcus						
Gomphospaeria						
Lyngbya	13.53	4.51	18.05	10.62	10.62	10.62
Merismopedia						
Microcystis						
Oscillatoria						
Radiocystis						
Small bluegreens						
Synechococcus						
Marssonella						
Total	13.53	4.51	18.05	10.62	10.62	10.62
GROUP 2						
Ankistrodesmus						
Ankrya						
Arthrodesmus						
Botryococcus						
Carteria	6.49			12.00		
Chlamydomonas	0.36	3.95		4.57	14.50	
Chodatella	0.79			5.94		
Closterium						
Coelastrum						
Collodictyon						
Cosmarium						
Crucigeniella		1.55			7.44	
Dictyosphaerium						
Elaktothrix						
Eudorina						
Gloeobotrys						
Kichnerella		1.61			4.75	
Monoraphidium	4.25	5.92	5.03	5.21	5.82	5.76
Mougeotia						
Oocystis	1.44	0.72		4.57	4.57	
Paulschulzia						
Pediastrum						
Planctonema						
Pyramidomonas						
Quadrigula						
Scenedesmus						
Schroederia						
Small greens						
Spirogrya						
Sponylosium						
Staurastrum						
Tellingia						
Tetraedon						
Westella						
Desmidium						
Scourfieldia						
Gyromitus	8.12	12.07	8.19	7.56	10.23	10.29
Chlorogonium						
Total	21.45	25.82	13.22	39.85	47.31	16.05

GENERA	BIOMASS (mg-m ⁻³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 3						
Astasia						
Euglena						
Trachelomonas						
Phacus						
Total	0.00	0.00	0.00	0.00	0.00	0.00
GROUP 4						
Biocoeca						
Bitrichia						
Chrysochromulina	19.21	29.06	22.97	14.99	12.99	14.99
Chrysoikos						
Small Chrysophyceae	20.93	24.78	29.71	4.48	4.57	4.48
Large Chrysophyceae	35.49	41.06	69.31	8.99	8.99	8.00
Dinobryon		3.00	0.40		30.60	4.75
Kephyrion						
Mallomonas						
Ochromonas						
Pteridomonas						
Salpingoeca	3.16	5.68		5.94	6.00	
Spinifiromonas						
Stelemonas	2.03	15.53	9.45	5.64	5.64	5.64
Stichogloecca						
Synura	13.00	7.21	30.17	10.48	9.86	10.46
Uroglena						
Epiphyxis						
Total	93.82	126.32	162.01	50.52	78.65	48.32
GROUP 5						
Asterionella	11.62	11.19	28.72	15.17	14.70	14.97
Cyclotella	123.22	41.26	35.80	8.00	24.35	23.61
Diatoma						
small Diatoms						
large Diatoms						
Fragilaria	0.34			6.46		
Frustula						
Gyrosigma						
Melosira	3741.84	3269.11	3228.17	139.77	134.74	134.66
Navicula						
Nitzschia						
Rhizosolenia						
Stephanodiscus						
Surirella						
Synedra	2.36	3.69	3.65	7.89	22.17	22.25
Tabellaria		9.61			13.92	
Stauromies						
Pennate Diatoms						
Total	3879.38	3334.86	3296.34	177.29	209.88	195.49
GROUP 6						
Cryptomonas	11.93	13.20	21.81	52.86	37.97	37.39
Katablepharis	12.93	10.78	9.34	5.76	5.76	5.76
Rhodomonas	163.09	224.81	176.66	14.41	14.41	14.41
Gonyostomun						
Total	187.95	248.79	207.81	73.03	58.14	57.56
GROUP 7						
Ceratium						
Gymnodinium	110.40	134.46	199.05	35.79	46.36	35.09
Peridinium	21.77	10.86	13.63	84.29	29.59	47.01
Total	132.17	145.32	212.68	120.08	75.95	82.10

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GENERA	BIOMASS (mg-m ³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 1						
Anabaena		64.99			25.85	
Aphanizomenon						
Aphanocapsa						
Aphanothece		2.51			8.74	
Chroococcus						
Gomphospaeria			4.89			36.00
Lyngbya	27.07	9.02		10.62	10.62	
Merismopedia						
Microcystis						
Oscillatoria						
Radiocystis						
Small bluegreens						
Synechococcus						
Marssonella						
Total	27.07	78.70	10.06	10.62	48.52	39.25
GROUP 2						
Ankistrodesmus						
Ankrya						
Arthrodesmus						
Botryococcus						
Carteria						
Chlamydomonas		3.73	10.72		14.20	18.75
Chodatella						
Closterium						
Coelastrum						
Collodictyon						
Cosmarium						
Crucigeniella						
Dictyosphaerium	2.93	0.75		4.02	3.68	
Elaktothrix						
Eudorina						
Gloeobotrys						
Kichnerella		0.43			3.06	
Monoraphidium	5.92	9.76	12.14	10.47	7.18	6.29
Mougeotia						
Oocystis			1.44			4.57
Paulschulzia		13.00			15.12	
Pediastrum						
Planctonema						
Pyramidomonas			0.99			16.76
Quadrigula						
Scenedesmus						
Schroederia						
Small greens						
Spirogrya						
Sponylosium						
Staurastrum						
Teilingia						
Tetraedon						
Westella						
Desmidium						
Scourfieldia						
Gyromitus		3.61	4.31		9.86	10.46
Chlorogonium						
Total	8.85	31.28	29.60	14.49	53.10	56.83

GENERA	BIOMASS (mg-m ³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 3						
Astasia						
Euglena						
Trachelomonas						
Phacus						
Total	0.00	0.00	0.00	0.00	0.00	0.00
GROUP 4						
Biocoea		2.44			6.00	
Bitrichia						
Chrysochromulina	87.90	87.75	12.14	13.98	14.24	4.99
Chrysoikos						
Small Chrysophyceae	33.15	19.61	25.52	4.99	4.99	4.51
Large Chrysophyceae	7.76	41.06	43.68	7.01	8.99	8.99
Dinobryon	18.04			26.77		
Kephyrion						
Mallomonas		1.30	6.83		34.92	33.07
Ochromonas						
Pteridomonas						
Salpingoeca	1.62	0.81	3.25	6.00	6.00	6.00
Spinifiromonas						
Stelemonas	20.26	2.70	12.16	5.64	5.64	5.64
Stichogloecca						
Synura		27.76	10.82		10.18	9.86
Uroglena						
Epiphyxis						
Total	168.73	183.43	114.40	64.39	90.96	73.06
GROUP 5						
Asterionella	20.37	40.55	51.96	15.47	15.09	15.08
Cyclotella	37.82	35.85	29.59	23.61	23.61	23.61
Diatoma						
small Diatoms						
large Diatoms						
Fragilaria						
Frustula						
Gyrosigma						
Melosira	1221.62	746.34	1562.47	134.47	133.24	134.54
Navicula						
Nitzschia						
Rhizosolenia	25.17	9.34		11.87	13.54	
Stephanodiscus						
Surirella						
Synedra	9.30	11.07	13.73	23.10	23.52	19.85
Tabellaria	2.17			13.74		
Stauronies						
Pennate Diatoms						
Total	1316.45	843.15	1657.75	222.26	209.00	193.08
GROUP 6						
Cryptomonas	3.70	37.17	28.25	32.20	54.78	54.78
Katablepharis	28.18	12.93	9.34	5.87	5.76	5.76
Rhodomonas	42.68	174.67	224.73	14.03	14.17	16.61
Gonyostomum						
Total	74.56	224.77	262.32	52.10	74.71	77.15
GROUP 7						
Ceratium						
Gymnodinium	31.10		15.27	30.00		36.49
Peridinium	24.05	3.61	2.77	47.33	32.55	17.42
Total	55.15	3.61	18.04	77.33	32.55	53.91

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GENERA	BIOMASS (mg-m ³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 1						
Anabaena	153.72	4.41	64.98	100.92	27.61	17.92
Aphanizomenon	4.27	6.79	7.28	13.39	13.39	13.39
Aphanocapsa						
Aphanothece						
Chroococcus						
Gomphospaeria						
Lyngbya	15.79		72.18	8.43		10.62
Merismopedia						
Microcystis						
Oscillatoria						
Radiocystis						
Small bluegreens						
Synechococcus						
Marssoniella	4.60			3.37		
Total	178.38	11.20	144.44	126.11	41.00	41.93
GROUP 2						
Ankistrodesmus						
Ankrya						
Arthrodesmus						
Botryococcus	8.23			34.00		
Carteria						
Chlamydomonas	15.96	3.04	7.64	24.25	14.41	23.22
Chodatella						
Closterium						
Coelastrum						
Collodictyon						
Cosmarium						
Crucigeniella						
Dictyosphaerium		0.40			2.99	
Elaktothrix			0.55			4.17
Eudorina						
Gloeobotrys						
Kichnerella						
Monoraphidium	10.42	7.47	7.29	6.52	5.35	6.52
Mougeotia		22.62			33.02	
Oocystis	1.44			4.57		
Paulschulzia		6.50			12.00	
Pediastrum						
Planctonema						
Pyramidomonas						
Quadrigula						
Scenedesmus		1.22	2.01		6.87	8.12
Schroederia						
Small greens	0.50	3.91		2.99	4.02	
Spirogrya						
Sponylosium						
Staurastrum						
Teilingia						
Tetraodon						
Westella						
Desmidium						
Scourfieldia						
Gyromitus	4.33	9.38		10.48	10.76	
Chlorogonium						
Total	40.88	54.54	17.49	82.81	89.42	42.03

GENERA	BIOMASS (mg-m ⁻³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 3						
Astasia						
Euglena	11.76	11.58		24.12	30.24	
Trachelomonas		15.27	1.22		18.00	18.00
Phacus						
Total	11.76	26.85	1.22	24.12	48.24	18.00
GROUP 4						
Biocoeca	1.62	3.85	1.62	5.23	8.00	6.00
Bitrichia						
Chrysochromulina	4.87	25.44	16.81	6.00	12.99	12.51
Chrysoikos						
Small Chrysophyceae	15.86	53.79	35.02	4.51	13.98	4.99
Large Chrysophyceae	32.33		36.21	7.01		7.01
Dinobryon	9.29	93.95	96.40	46.96	24.95	26.95
Kephyrion						
Mallomonas						
Ochromonas						
Pteridomonas						
Salpingoeca		2.44	14.61		6.00	6.00
Spinifiromonas						
Stelxmonas	11.48	7.18	4.73	5.64	5.76	5.64
Stichogloecca	4.31			5.23		
Synura	8.66		18.03	10.48		9.86
Uroglena						
Epiphyxis						
Total	88.42	186.65	223.43	91.06	71.68	78.96
GROUP 5						
Asterionella	11.25	12.75	9.38	15.15	15.28	15.16
Cyclotella	7.73	6.01	5.95	25.40	25.43	16.35
Diatoma						
small Diatoms						
large Diatoms						
Fragilaria						
Frustula						
Gyrosigma						
Melosira	1479.57	787.03	753.67	130.40	139.47	125.22
Navicula						
Nitzschia						
Rhizosolenia		15.85			12.82	
Stephanodiscus						
Surirella						
Synedra	9.67	5.74	3.84	23.07	23.20	23.24
Tabellaria	6.33	9.65		16.28	17.92	
Stauromies						
Pennate Diatoms						
Total	1514.55	837.03	772.84	210.30	234.12	179.97
GROUP 6						
Cryptomonas	9.91	19.38	11.10	36.48	55.28	33.64
Katablepharis	9.34	8.62	11.49	5.76	5.76	5.76
Rhodomonas	60.89	39.59	136.54	14.71	14.41	13.37
Gonyostomon						
Total	80.14	67.59	159.13	56.95	75.45	52.77
GROUP 7						
Ceratium						
Gymnodinium			27.57			46.35
Peridinium	3.45	1.48	17.85	16.76	16.75	58.65
Total	3.45	1.48	45.42	16.76	16.75	105.00

THREEPOINT LAKE August 13 1989

GENERA	BIOMASS (mg-m ⁻³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 1						
Anabaena	31.55	7.06	7.13	59.79	57.44	28.31
Aphanizomenon	0.42			12.65		
Aphanocapsa						
Aphanothece						
Chroococcus						
Gomphospaeria						
Lyngbya			2.26			8.43
Merismopedia						
Microcystis						
Oscillatoria						
Radiocystis						
Small bluegreens						
Synechococcus						
Marssoniella						
Total	31.97	7.06	9.39	72.44	57.44	36.74
GROUP 2						
Ankistrodesmus		3.19			5.21	
Ankrya						
Arthrodesmus						
Botryococcus						
Carteria		2.65			8.90	
Chlamydomonas		5.13	4.58		20.72	14.54
Chodatella		0.35			4.54	
Closterium						
Coelastrum						
Collodictyon						
Cosmarium						
Crucigeniella						
Dictyosphaerium	1.21			2.99		
Elaktothrix			0.24			4.02
Eudorina						
Gloeobotrys						
Kichnerella						
Monoraphidium	1.18			6.79		
Mougeotia						
Oocystis						
Paulschulzia		45.14			22.89	
Pediastrum						
Planctonema						
Pyramidomonas						
Quadrifida						
Scenedesmus	1.08			6.59		
Schroederia						
Small greens						
Spirogrya						
Sponylosium						
Staurastrum						
Teilingia						
Tetraedon						
Westella						
Desmidium						
Scourfieldia		4.25			6.56	
Gyromitus	37.53	18.76	164.48	10.76	10.76	12.21
Chlorogonium						
Total	41.00	79.47	169.30	27.13	79.58	30.77

GENERA	BIOMASS (mg-m ³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 3						
Astasia						
Euglena						
Trachelomonas	3.66	6.72	3.05	18.00	18.00	18.00
Phacus						
Total	3.66	6.72	3.05	18.00	18.00	18.00
GROUP 4						
Biocoeca			2.15			8.30
Bitrichia						
Chrysochromulina	6.55	18.68	13.64	4.51	4.99	12.48
Chrysoikos						
Small Chrysophyceae	14.89	15.41	12.16	4.75	3.98	4.48
Large Chrysophyceae	8.19	16.81	7.70	8.99	7.01	8.00
Dinobryon						
Kephyrion						
Mallomonas	11.49	16.95	20.27	37.00	37.97	51.36
Ochromonas						
Pteridomonas						
Salpingoeca	2.44		2.44	6.00		6.00
Spinifiromonas			1.93			8.00
Stelemonas	3.38	1.35	0.72	5.64	5.64	5.76
Stichogloece						
Synura						
Uroglena						
Epiphyxis						
Total	46.94	69.20	61.01	66.89	59.59	104.38
GROUP 5						
Asterionella	3.96	1.74	1.08	15.16	15.01	15.09
Cyclotella	17.73	7.57	6.48	45.41	29.06	29.06
Diatoma						
small Diatoms						
large Diatoms						
Fragilaria	3.26			10.91		
Frustula						
Gyrosigma						
Melosira	35.81	3.85	12.79	63.04	26.38	78.08
Navicula						
Nitzschia						
Rhizosolenia	15.52	5.68		16.04	11.47	
Stephanodiscus						
Surirella						
Synedra	0.12	0.62	0.77	7.26	22.80	22.73
Tabellaria						
Stauronites						
Pennate Diatoms						
Total	76.40	19.46	21.12	157.82	104.72	144.96
GROUP 6						
Cryptomonas	287.91	180.00	314.63	55.28	57.36	75.94
Katablepharis	17.24	17.24	20.12	5.76	5.76	5.76
Rhodomonas	136.06	175.06	242.62	14.17	14.41	13.90
Gonyostomum						
Total	441.21	372.30	577.37	75.21	77.53	95.60
GROUP 7						
Ceratium						
Gymnodinium	6.77		14.43	12.16		9.86
Peridinium	3.94	3.26	3.32	16.75	31.45	17.42
Total	10.71	3.26	17.75	28.91	31.45	27.28

THREEPOINT LAKE Sept. 13 1989

GENERA	BIOMASS (mg-m ³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 1						
Anabaena	1.87		6.28	26.12		27.13
Aphanizomenon	11.26	17.69		47.55	72.65	
Aphanocapsa						
Aphanothece						
Chroococcus						
Gomphospaeria						
Lyngbya	4.51		3.38	10.62		9.65
Merismopedia						
Microcystis						
Oscillatoria						
Radiocystis						
Small bluegreens	0.23			1.56		
Synechococcus						
Marssoniella	3.28			3.31		
Total	21.15	17.69	9.66	89.16	72.65	36.78
GROUP 2						
Ankistrodesmus						
Ankrya						
Arthrodesmus						
Botryococcus	4.89		4.89	36.00		36.00
Carteria	1.93			8.00		
Chlamydomonas	5.65	7.03	33.82	20.35	13.88	10.00
Chodatella						
Closterium	16.03	0.36	0.18	25.72	11.93	11.90
Coelastrum		1.62			7.56	
Colodictyon						
Cosmarium						
Crucigeniella						
Dictyosphaerium						
Elaktothrix						
Eudorina						
Gloeobotrys						
Kichnerella						
Monoraphidium	5.46	3.72	7.49	9.37	4.13	11.53
Mougeotia						
Oocystis	8.10	1.24	27.77	8.14	4.35	16.70
Paulschulzia						
Pediastrum						
Planctonema						
Pyramidomonas						
Quadrigula						
Scenedesmus		1.80			6.20	
Schroederia						
Small greens						
Spirogrya						
Sponylosium						
Staurostrum						
Teilingia						
Tetraedon						
Westella						
Desmidium		2.13			6.56	
Scourfieldia						
Gyromitus	147.29	177.61	250.39	10.48	10.48	12.16
Chlorogonium						
Gloeococcus		2.84			3.98	
Total	189.35	198.35	324.54	118.06	69.07	98.29

GENERA	BIOMASS (mg-m ⁻³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 3						
Astasia			2.01			26.78
Euglena						
Trachelomonas	3.05	4.27	0.61	18.00	18.00	18.00
Phacus						
Total	3.05	4.27	2.62	18.00	18.00	44.78
GROUP 4						
Biocoeca	1.93	13.48	3.25	8.00	8.00	6.00
Bitrichia						
Chrysochromulina	4.05	15.47	6.54	4.48	12.99	4.99
Chrysoikos						
Small Chrysophyceae	20.55	11.67	32.22	4.99	4.99	4.99
Large Chrysophyceae		5.46			8.99	
Dinobryon		101.44			11.05	
Kephyrion						
Mallomonas	6.95	15.32	4.74	37.97	46.15	44.63
Ochromonas						
Pteridomonas						
Salpingoeca	1.62	3.25	17.05	6.00	6.00	6.00
Spinifiromonas						
Stelixmonas	8.10	10.78		5.64	5.76	
Stichogloecca						
Synura		6.00			38.55	
Uroglena						
Epiphyxis						
Total	43.20	182.87	63.80	67.08	142.48	66.61
GROUP 5						
Asterionella	0.70	17.18	0.91	15.17	15.42	15.42
Cyclotella	80.49	15.20	58.02	29.06	21.80	29.06
Diatoma						
small Diatoms						
large Diatoms						
Fragilaria						
Frustula						
Gyrosigma						
Melosira	58.53	90.25	33.57	62.86	72.36	73.44
Navicula						
Nitzschia						
Rhizosolenia		5.89			11.61	
Stephanodiscus						
Surirella						
Synedra	0.06	0.70	0.56	8.43	22.89	22.80
Tabellaria						
Stauronites						
Pennate Diatoms						
Total	139.78	129.22	93.06	115.52	144.08	140.72
GROUP 6						
Cryptomonas	222.81	160.89	182.40	56.57	54.81	73.15
Katablepharis	20.12	20.12	19.40	5.76	5.76	5.76
Rhodomonas	160.49	253.27	339.93	14.41	14.17	14.17
Gonyostomon						
Total	403.42	434.28	541.73	76.74	74.74	93.08
GROUP 7						
Ceratium						
Gymnodinium		17.37	31.13		38.10	99.19
Peridinium	1.66	1.66	0.55	17.42	17.42	17.42
Total	1.66	19.03	31.68	17.42	55.52	116.61

Appendix A3. Phytoplankton data from Cross Lake, 1989

Group

1. Cyanophyceae - bluegreen
2. Chlorophyceae - greens
3. Euglenophyceae - euglenophytes
4. Chrysophyceae - chrysophytes
5. Bacillario phyceae - diatoms
6. Cryptophyceae - cryptophytes
7. Peridineae - dinoflagellates

CROSS LAKE June 6 1989

GENERA	BIOMASS (mg-m ³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 1						
Anabaena	1.31	129.64	20.11	2.99	18.41	19.73
Aphanizomenon						
Aphanocapsa						
Aphanothece						
Chroococcus			20.64			4.99
Gomphospaeria	2.06	47.14	9.16	27.00	23.00	18.00
Lyngbya	22.56	1417.48	2182.17	10.62	9.65	9.65
Merismopedia			20.16			9.90
Microcystis						
Oscillatoria						
Radiocystis						
Small bluegreens						
Synechococcus						
Marssonella						
Total	25.93	1594.26	2252.24	40.61	51.06	62.27
GROUP 2						
Ankistrodesmus	4.73			5.64		
Ankrya						
Arthrodesmus						
Botryococcus	4.89	13.40		36.00	40.00	
Carteria						
Chlamydomonas		103.25	2.22		14.15	4.75
Chodatella		10.00			4.31	
Closterium						
Coelastrum			166.19			20.00
Collodictyon						
Cosmarium						
Crucigeniella						
Dictyosphaerium		9.44			2.99	
Elaktothrix						
Eudorina						
Gloeobotrys						
Kichnerella						
Monoraphidium		63.01	44.13		10.88	10.88
Mougeotia						
Oocystis		134.05	25.00		14.16	4.31
Paulschulzia						
Pediastrum	20.11	3016.94	19436.06	40.00	78.00	78.00
Planctonema						
Pyramidomonas			2.46			16.76
Quadrigula						
Scenedesmus	0.62	849.25	2893.40	4.35	44.59	41.74
Schroederia						
Small greens		87.30			7.49	
Spirogrya						
Sponylosium						
Staurostrum		22.20	20.00		59.00	26.73
Teilingia						
Tetraedon	4.22		95.72	7.21		9.16
Westella						
Desmidium						
Scourfieldia	0.50			5.09		
Gyromitus		23.93			10.48	
Chlorogonium						
Total	35.07	4332.77	22685.18	98.29	286.05	212.33

GENERA	BIOMASS (mg-m ³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 3						
Astasia		2.83	12.16		30.02	28.53
Euglena						
Trachelomonas	0.61			18.00		
Phacus						
Total	0.61	2.83	12.16	18.00	30.02	28.53
GROUP 4						
Biocoeca			4.48			6.00
Bitrichia						
Chrysochromulina	14.40	104.45	15.48	12.75	4.48	4.99
Chrysoikos						
Small Chrysophyceae	23.45	144.45	268.26	4.02	4.99	4.99
Large Chrysophyceae	40.43	64.29	35.71	8.00	7.01	7.01
Dinobryon	41.16	985.09	1864.83	12.22	29.97	25.96
Kephyrion			8.97			6.00
Mallomonas						
Ochromonas						
Pteridomonas	7.51			10.00		
Salpingoeca	8.93	273.53	98.65	6.00	6.00	6.00
Spinifiromonas						
Stelemonas	27.46			16.12		
Stichogloecca						
Synura						
Uroglena						
Epiphyxis						
Total	163.34	1571.81	2296.38	69.11	52.45	60.95
GROUP 5						
Asterionella	1.81	4.95	17.26	15.96	15.23	15.07
Cyclotella	6.84	20.74	12.56	29.06	13.89	18.17
Diatoma						
small Diatoms						
large Diatoms						
Fragilaria		36.80	49.00		7.82	7.82
Frustula						
Gyrosigma	13.20	10.16	33.86	50.13	31.86	31.86
Melosira		46.18	289.02		39.79	41.02
Navicula						
Nitzschia	2.08			8.21		
Rhizosolenia	6.30	1.67		11.88	4.31	
Stephanodiscus						
Surirella						
Synedra	3.46	522.07	632.27	21.48	22.98	8.65
Tabellaria	53.38			16.29		
Stauronites						
Pennate Diatoms						
Total	87.07	642.57	1033.97	153.01	135.88	122.59
GROUP 6						
Cryptomonas	10.86	6.51	36.24	52.61	34.62	37.47
Katablepharis	15.80	79.37	51.59	5.76	5.76	5.76
Rhodomonas	187.79	50.04	13.30	13.90	13.66	13.42
Gonyostomum						
Total	214.45	135.92	101.13	72.27	54.04	56.65
GROUP 7						
Ceratium						
Gymnodinium	0.42			15.95		
Peridinium						
Total	0.42	0.00	0.00	15.95	0.00	0.00

CROSS LAKE July 4 1989

GENERA	BIOMASS (mg-m ⁻³)			ESD		
	Stn. 1	Stn. 2	Stn. 3 +	Stn. 1	Stn. 2	Stn. 3
GROUP 1						
Anabaena	28.31	1161.66	27.52	52.04	75.41	57.38
Aphanizomenon			6.78			13.39
Aphanocapsa						
Aphanothece						
Chroococcus						
Gomphospaeria	2.90		7.24	24.00		24.00
Lyngbya	57.52	466.28	72.18	9.65	9.65	10.62
Merismopedia			55.83			6.35
Microcystis						
Oscillatoria						
Radiocystis						
Small bluegreens						
Synechococcus						
Marssonella						
Total	88.73	1627.94	169.55	85.69	85.06	111.74
GROUP 2						
Ankistrodesmus						
Ankrya			0.96			6.35
Arthrodesmus						
Botryococcus	4.89			36.00		
Carteria						
Chlamydomonas		53.81	35.51		11.13	17.66
Chodatella	0.31	4.17		4.35	4.06	
Closterium	0.36	10.37	0.36	11.93	18.76	11.93
Coelastrum			6.86			32.00
Collodictyon						
Cosmarium						
Crucigeniella	1.44			4.57		
Dictyosphaerium	2.21	31.43	14.46	2.99	3.48	3.98
Elaktothrix						
Eudorina						
Gloeobotrys						
Kichnerella	2.87	4.92	9.02	3.63	3.90	8.43
Monoraphidium	7.69	20.64	19.98	15.24	4.99	10.82
Mougeotia						
Oocystis	7.04	46.67	3.40	4.54	4.75	4.35
Paulschulzia						
Pediastrum	34.43	1861.38	68.86	77.99	77.99	78.00
Planctonema						
Pyramidomonas						
Quadrigula						
Scenedesmus	7.90	502.55	51.36	12.80	47.93	31.79
Schroederia						
Small greens		8.73			7.49	
Spirogrya						
Sponylosium		8.53			7.43	
Staurostrum						
Teilingia						
Tetraedon						
Westella						
Desmidium						
Scourfieldia						
Gyromitus			43.32			10.48
Chlorogonium						
Gloeococcus	1.90			3.98		
Total	71.04	2553.20	254.09	178.02	191.91	215.79

GENERA	BIOMASS (mg-m ³)			ESD		
	Stn. 1	Stn. 2	Stn. 3 ⁺	Stn. 1	Stn. 2	Stn. 3
GROUP 3						
Astasia						
Euglena	2.00	84.42		26.73	29.95	
Trachelomonas	1.22			18.00		
Phacus						
Total	3.22	84.42	0.00	44.73	29.95	0.00
GROUP 4						
Biocoeca	0.81	4.48		6.00	6.00	
Bitrichia						
Chrysochromulina	11.03	64.48		4.51	4.99	
Chrysoikos						
Small Chrysophyceae	32.69	136.71		4.99	4.99	
Large Chrysophyceae	7.72	14.29		6.99	7.01	
Dinobryon		191.43			13.21	
Kephyrion						
Mallomonas						
Ochromonas						
Pteridomonas						
Salpingoeca	11.37	22.42		6.00	6.00	
Spinifiromonas						
Stelxmonas						
Stichogloeca						
Synura						
Uroglena						
Epiphyxis						
Total	63.62	433.81	0.00	28.49	42.20	0.00
GROUP 5						
Asterionella	1.97	7.61		15.79	15.72	
Cyclotella	9.01	15.70		29.06	18.17	
Diatoma						
small Diatoms						
large Diatoms						
Fragilaria						
Frustula						
Gyrosigma	8.25	173.40		34.03	47.97	
Melosira		406.86			67.40	
Navicula						
Nitzschia						
Rhizosolenia		130.16			11.61	
Stephanodiscus		25.13			36.34	
Surirella		98.92			57.38	
Synedra	2.87	76.92		8.54	22.80	
Tabellaria						
Stauronies						
Pennate Diatoms						
Total	22.10	934.70	0.00	87.42	277.39	0.00
GROUP 6						
Cryptomonas	40.44	21.82		53.26	39.26	
Katablepharis	17.96	43.65		5.76	5.76	
Rhodomonas	320.46	77.62		13.43	14.41	
Gonyostomun						
Total	378.86	143.09	0.00	72.45	59.43	0.00
GROUP 7						
Ceratium						
Gymnodinium						
Peridinium	5.30	3.08		46.34	18.05	
Total	5.30	3.08	0.00	46.34	18.05	0.00

+ As in 1988, water level to low at station 3 to collect a sample.

CROSS LAKE August 22 1989

GENERA	BIOMASS (mg-m ⁻³)			ESD		
	Stn. 1	Stn. 2 ⁺	Stn. 3 ⁺⁺	Stn. 1	Stn. 2	Stn. 3
GROUP 1						
Anabaena	27.52			57.38		
Aphanizomenon	6.78			13.39		
Aphanocapsa						
Aphanothece						
Chroococcus						
Gomphospaeria	7.24			24.00		
Lyngbya	72.18			10.62		
Merismopedia	55.83			6.35		
Microcystis						
Oscillatoria						
Radiocystis						
Small bluegreens						
Synechococcus						
Marssonella						
Total	169.55	0.00	0.00	111.74	0.00	0.00
GROUP 2						
Ankistrodesmus						
Ankrya	0.96			6.35		
Arthrodesmus						
Botryococcus						
Carteria						
Chlamydomonas	35.51			17.66		
Chodatella						
Closterium	0.36			11.93		
Coelastrum	6.86			32.00		
Collodictyon						
Cosmarium						
Crucigeniella						
Dictyosphaerium	14.46			3.98		
Elaktothrix						
Eudorina						
Gloeobotrys						
Kichnerella	9.02			8.43		
Monoraphidium	19.98			10.82		
Mougeotia						
Oocystis	3.40			4.35		
Paulschulzia						
Pediastrum	68.86			78.00		
Planctonema						
Pyramidomonas						
Quadrigula						
Scenedesmus	51.36			31.79		
Schroederia						
Small greens						
Spirogrya						
Sponylosium						
Staurostrum						
Teilingia						
Tetraedon						
Westella						
Desmidium						
Scourfieldia						
Gyromitus	43.32			10.48		
Chlorogonium						
Total	254.09	0.00	0.00	215.79	0.00	0.00

GENERA		BIOMASS (mg-m ³)			ESD		
		Stn. 1	Stn. 2 ⁺	Stn. 3 ⁺⁺	Stn. 1	Stn. 2	Stn. 3
GROUP 3							
Astasia							
Euglena							
Trachelomonas							
Phacus							
Total		0.00	0.00	0.00	0.00	0.00	0.00
GROUP 4							
Biocoeca		1.93			8.00		
Bitrichia							
Chrysochromulina		6.07			4.99		
Chrysoikos							
Small Chrysophyceae		13.19			4.02		
Large Chrysophyceae		7.76			7.01		
Dinobryon		9.02			13.39		
Kephyrion							
Mallomonas		3.77			37.01		
Ochromonas							
Pteridomonas							
Salpingoeca		4.87			6.00		
Spinifiromonas							
Stelexmonas		2.70			5.64		
Stichogloecca							
Synura							
Uroglena							
Epiphyxis							
Total		49.31	0.00	0.00	86.06	0.00	0.00
GROUP 5							
Asterionella		0.12			8.26		
Cyclotella		24.52			29.06		
Diatoma							
small Diatoms							
large Diatoms							
Fragilaria							
Frustula							
Gyrosigma							
Melosira							
Navicula							
Nitzchia							
Rhizosolenia		5.78			11.54		
Stephanodiscus							
Surirella							
Synedra		4.15			23.04		
Tabellaria							
Stauronies							
Pennate Diatoms							
Total		34.57	0.00	0.00	71.90	0.00	0.00
GROUP 6							
Cryptomonas		48.55			57.15		
Katablepharis		15.09			5.76		
Rhodomonas		472.45			14.41		
Gonyostomon							
Total		536.09	0.00	0.00	77.32	0.00	0.00
GROUP 7							
Ceratium							
Gymnodinium		6.77			12.16		
Peridinium							
Total		6.77	0.00	0.00	12.16	0.00	0.00

+ Sample not taken as a result of surrounding forest fire activity.

++ As in 1988, water level too low to collect a sample.

CROSS LAKE September 12 1989

GENERA	BIOMASS (mg-m ³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 1						
Anabaena		9.74			45.31	
Aphanizomenon	28.15	0.50	2.51	16.87	16.87	16.87
Aphanocapsa	2.16			6.59		
Aphanothece	2.60			23.15		
Chroococcus						
Gomphospaeria	51.47	10.29	88.30	32.00	32.00	24.00
Lyngbya	60.91		77.82	9.65		9.65
Merismopedia	37.54	7.70		6.35	6.35	
Microcystis						
Oscillatoria						
Radiocystis						
Small bluegreens						
Synechococcus						
Dactylococcopsis	4.14			3.58		
Total	186.97	28.23	168.63	98.19	100.53	50.52
GROUP 2						
Ankistrodesmus						
Ankrya						
Arthrodesmus						
Botryococcus			16.09			28.00
Carteria						
Chlamydomonas	4.15	17.75	8.61	12.20	14.86	12.94
Chodatella			0.54			5.23
Closterium	15.21	2.83	1.19	41.93	30.00	11.74
Coelastrum	2.90			24.00		
Collodictyon						
Cosmarium						
Crucigeniella	17.24		0.09	18.28		2.92
Dictyosphaerium	20.63	1.08	3.62	3.98	4.57	2.99
Elaktothrix						
Eudorina						
Gloeobotrys						
Kichnerella	0.89	0.89		3.90	3.90	
Monoraphidium	10.34	23.42	32.50	14.66	15.44	14.73
Mougeotia						
Oocystis	27.07	0.91	13.73	12.16	4.31	4.54
Paulschulzia						
Pediastrum	54.38	192.84	66.58	79.00	79.00	48.00
Planctonema						
Pyramidomonas						
Quadrigula						
Scenedesmus	9.03	88.26	377.42	13.39	27.85	46.92
Schroederia						
Small greens		1.58	9.48		7.49	7.49
Spirogrya						
Sponylosium						
Staurastrum						
Teilingia						
Tetraedon		13.36	12.21		6.86	6.87
Westella						
Desmidium						
Scourfieldia						
Gyromitus		13.00			10.48	
Selenastrum			2.90			24.00
Gloeococcus			1.90			3.98
Total	163.45	358.33	546.86	226.49	207.75	220.35

GENERA	BIOMASS (mg-m ³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 3						
Astasia						
Euglena		5.54	3.20		26.03	31.26
Trachelomonas						
Phacus						
Total	0.00	5.54	3.20	0.00	26.03	31.26
GROUP 4						
Biocoeca	0.81			6.00		
Bitrichia						
Chrysochromulina	26.15	72.31	217.93	4.99	14.51	13.98
Chrysoikos		0.71	0.20		5.74	2.99
Small Chrysophyceae	38.76	21.48	29.89	4.99	4.99	4.99
Large Chrysophyceae	5.17	12.93	19.40	7.01	7.01	7.01
Dinobryon		31.04	10.20		24.24	31.90
Kephyrion		2.44	0.81		6.00	6.00
Monomonas	0.54	0.54		17.31	17.31	
Ochromonas						
Pteridomonas						
Salpingoeca	2.87	4.06	15.42	5.76	6.00	6.00
Spinifiromonas		0.81			6.00	
Stellexmonas	0.72			5.76		
Stichogloecca						
Synura						
Uroglena						
Epiphyxis						
Total	75.02	146.32	293.85	51.82	91.80	72.87
GROUP 5						
Asterionella	4.90	7.96	12.01	15.70	15.48	15.48
Cyclotella	16.88	4.58		25.43	25.43	
Diatoma						
small Diatoms						
large Diatoms						
Fragilaria						
Frustula						
Gyrosigma		128.08			45.48	
Melosira	16.97	77.00	46.18	43.27	67.41	41.89
Navicula						
Nitzschia						
Rhizosolenia	30.32	34.66	135.05	12.63	13.21	14.83
Stephanodiscus	5.03			36.34		
Surirella		19.78			57.38	
Synedra	5.18	2.14	2.89	39.67	8.70	8.43
Tabellaria						
Stauromies						
Pennate Diatoms		2.91			17.72	
Total	79.28	277.11	196.13	173.04	250.81	80.63
GROUP 6						
Cryptomonas	33.89	19.59	28.34	54.78	55.28	155.28
Katablepharis	10.06	5.75	25.86	5.76	5.76	5.76
Rhodomonas	177.47	300.01	203.76	14.17	14.41	14.65
Gonyostomun						
Total	221.42	325.35	257.96	74.71	75.45	175.69
GROUP 7						
Ceratium		9.19			44.44	
Gymnodinium			4.81			35.80
Peridinium		21.22	0.55		57.42	17.42
Total	0.00	30.41	5.36	0.00	101.86	53.22

Appendix A4. Phytoplankton data from Sipiwesk Lake, 1989

Group

1. Cyanophyceae - bluegreen
2. Chlorophyceae - greens
3. Euglenophyceae - euglenophytes
4. Chrysophyceae - chrysophytes
5. Bacillario phyceae - diatoms
6. Cryptophyceae - cryptophytes
7. Peridineae - dinoflagellates

SIPIWESK LAKE June 6 1989

GENERA	BIOMASS (mg-m ⁻³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 1						
Anabaena			5.23			36.82
Aphanizomenon	30.90		0.25	13.39		13.39
Aphanocapsa						
Aphanothece						
Chroococcus						
Gomphospaeria					8.77	8.77
Lyngbya		17.75	15.22			
Merismopedia						
Microcystis				30.00		
Oscillatoria	16.96					
Radiocystis						
Small bluegreens						
Synechococcus						
Marssonella						
Total	47.86	17.75	20.70	43.39	8.77	58.98
GROUP 2						
Ankistrodesmus						
Ankrya						
Arthrodesmus					39.00	
Botryococcus		12.42			10.00	
Carteria		11.27				
Chlamydomonas					4.57	6.87
Chodatella		0.36	2.44			
Closterium						
Coelastrum						
Collodictyon						
Cosmarium						
Crucigeniella						4.02
Dictyosphaerium			5.37			
Elaktothrix						
Eudorina						
Gloeobotrys						
Kichnerella						
Monoraphidium	0.58	1.86	2.77	5.37	4.13	10.37
Mougeotia						4.54
Oocystis			2.11		12.70	
Paulschulzia		7.70			41.00	48.00
Pediastrum		7.22	23.16			
Planctonema						
Pyramidomonas						
Quadrigula						
Scenedesmus						
Schroederia					5.30	3.90
Small greens		2.24	1.34			
Spirogrya						
Sponylosium						
Staurastrum						
Teilingia					6.87	
Tetraedon		4.89				
Westella						
Desmidium						
Scourfieldia					11.03	
Gyromitus		10.10			15.72	
Chlorogonium		14.62				
Total	0.58	72.68	37.19	5.37	150.32	77.70

GENERA	BIOMASS (mg-m ³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 3						
Astasia						
Euglena						
Trachelomonas	3.05	3.05		17.99	18.00	
Phacus						
Total	3.05	3.05	0.00	17.99	18.00	0.00
GROUP 4						
Biocoeca						
Bitrichia						
Chrysochromulina	85.94	51.37	96.28	14.99	4.99	14.99
Chrysoikos						
Small Chrysophyceae	17.28	23.81	27.08	4.99	4.99	4.99
Large Chrysophyceae	98.19	79.17	35.49	8.00	8.99	8.99
Dinobryon	11.03	46.29	43.32	41.62	10.08	13.21
Kephyrion						
Mallomonas		0.59			17.77	
Ochromonas						
Pteridomonas						
Salpingoeca	1.62		6.49	12.00		6.00
Spinifiromonas						
Stelixmonas	0.68	22.27	8.78	5.64	5.76	5.64
Stichogloecca						
Synura						
Uroglena	15.52	21.98	7.76	7.01	7.01	7.01
Epiphyxis						
Total	230.26	245.48	225.20	94.25	59.59	60.83
GROUP 5						
Asterionella	0.33	23.12	16.53	14.81	15.84	15.64
Cyclotella	3.14	10.41	17.14	18.17	25.43	25.43
Diatoma						
small Diatoms						
large Diatoms						
Fragilaria						
Frustula						
Gyrosigma						
Melosira	45.69	6.28	16.34	76.89	39.15	42.73
Navicula						
Nitzschia						
Rhizosolenia	10.35	20.93	6.48	14.01	14.07	9.51
Stephanodiscus						
Surirella						
Synedra	1.83	7.62	9.91	23.07	23.07	23.07
Tabellaria		17.69	28.34		12.43	12.43
Stauronites						
Pennate Diatoms						
Total	61.34	86.05	94.74	146.95	129.99	128.81
GROUP 6						
Cryptomonas	9.77	29.32	41.18	34.62	57.82	57.82
Katablepharis	7.18	7.90	12.21	5.76	5.76	5.76
Rhodomonas	51.02	178.77	155.97	14.41	14.41	14.41
Gonyostomum						
Total	67.97	215.99	209.36	54.79	77.99	77.99
GROUP 7						
Ceratium						
Gymnodinium	134.43	20.68		81.32	75.51	
Peridinium		1.66	1.11		17.42	17.42
Total	134.43	22.34	1.11	81.32	92.93	17.42

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GENERA	BIOMASS (mg-m ³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 1						
Anabaena	1437.46	48.03	45.27	32.23	71.69	74.31
Aphanizomenon	113.61	15.08	13.07	74.80	21.25	21.25
Aphanocapsa						
Aphanothece						
Chroococcus						
Gomphospaeria			0.97			21.00
Lyngbya		27.90			8.77	
Merismopedia						
Microcystis						
Oscillatoria						
Radiocystis						
Small bluegreens						
Synechococcus						
Marssoniiella						
Total	1551.07	91.01	59.31	107.03	101.71	116.56
GROUP 2						
Ankistrodesmus						
Ankrya						
Arthrodesmus						
Botryococcus	5.10			23.00		
Carteria						
Chlamydomonas		3.61	2.08		9.86	12.52
Chodatella		0.36	0.36		4.57	4.57
Closterium	0.24	0.53	0.31	9.11	11.93	14.37
Coelastrum						
Collodictyon						
Cosmarium		1.22			22.68	
Crucigeniella						
Dictyosphaerium		14.66	10.06		4.02	3.77
Elaktothrix						
Eudorina						
Gloeobotrys						
Kichnerella						
Monoraphidium	0.27	9.57	25.24	4.13	9.54	14.47
Mougeotia						
Oocystis		25.98	5.63		7.56	4.54
Paulschulzia						
Pediastrum		58.18	54.36		70.00	47.00
Planctonema						
Pyramidomonas						
Quadrigula						
Scenedesmus		1.62	4.87		7.56	8.65
Schroederia						
Small greens	20.63	1.47		14.00	4.02	
Spirogrya						
Sponylosium						
Staurastrum						
Teilingia						
Tetraedon			1.21			6.86
Westella						
Desmidium						
Scourfieldia						
Gyromitus						
Chlorogonium			5.88			11.61
Total	26.24	117.20	110.00	50.24	151.74	128.36

GENERA	BIOMASS (mg-m ³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 3						
Astasia						
Euglena		2.19			27.53	
Trachelomonas		1.83	1.83		18.00	18.00
Phacus						
Total	0.00	4.02	1.83	0.00	45.53	18.00
GROUP 4						
Biocoeca		0.81	3.88		6.00	7.01
Bitrichia						
Chrysochromulina	55.57	84.20	55.63	4.99	14.99	14.99
Chrysoikos						
Small Chrysophyceae	23.35	34.56	44.83	4.99	4.99	4.99
Large Chrysophyceae	16.38	5.17	7.76	8.99	7.01	7.01
Dinobryon						
Kephyrion						
Mallomonas	16.25			16.29		
Ochromonas						
Pteridomonas						
Salpingoeca	9.05	4.06	2.67	7.01	6.00	6.19
Spinifiromonas						
Stelemonas	1.35		1.35	5.64		5.64
Stichogloecca						
Synura						
Uroglena	3.88			7.01		
Epiphyxis						
Total	125.83	128.80	116.12	54.92	38.99	45.83
GROUP 5						
Asterionella	0.37	53.03	30.12	8.37	15.72	15.90
Cyclotella	7.21	10.79	12.66	29.06	29.06	23.93
Diatoma						
small Diatoms						
large Diatoms						
Fragilaria						
Frustula						
Gyrosigma						
Melosira		178.65	97.10		76.91	126.65
Navicula						
Nitzschia						
Rhizosolenia		13.40	2.08		8.93	8.20
Stephanodiscus						
Surirella						
Synedra	1.04	4.76	8.07	8.70	23.07	8.70
Tabellaria		2.44			12.47	
Stauromies						
Pennate Diatoms						
Total	8.62	263.07	150.03	46.13	166.16	183.38
GROUP 6						
Cryptomonas	1.08	141.80	65.58	34.62	57.82	60.66
Katablepharis	17.96	7.18	5.75	5.76	5.76	5.76
Rhodomonas	480.69	373.14	346.77	14.41	14.41	14.41
Gonyostomon						
Total	499.73	522.12	418.10	54.79	77.99	80.83
GROUP 7						
Ceratium						
Gymnodinium						
Peridinium		48.02	58.21		57.42	65.04
Total	0.00	48.02	58.21	0.00	57.42	65.04

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GENERA	BIOMASS (mg-m ⁻³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 1						
Anabaena		3.22	29.56		31.34	34.29
Aphanizomenon	13.06	9.04	10.55	13.39	13.39	13.39
Aphanocapsa						
Aphanothece						
Chroococcus						
Gomphospaeria	62.18	10.67	8.73	25.00	21.00	21.00
Lyngbya	81.15	27.90	20.29	8.77	8.77	8.77
Merismopedia	121.29	12.69	14.01	6.35	4.77	4.57
Microcystis			0.30			14.20
Oscillatoria						
Radiocystis						
Small bluegreens						
Synechococcus						
Marssoniiella						
Total	277.68	63.52	83.44	53.51	79.27	96.22
GROUP 2						
Ankistrodesmus	3.59			6.20		
Ankrya						
Arthrodesmus						
Botryococcus	26.81			40.00		
Carteria	41.26	10.32	6.50	14.00	14.00	12.00
Chlamydomonas		6.50	0.20		12.00	2.99
Chodatella		0.36			4.57	
Closterium	17.88	1.07	0.53	38.25	11.93	11.93
Coelastrum						
Collodictyon						
Cosmarium						
Crucigeniella		0.36			4.57	
Dictyosphaerium	15.89	8.53	5.86	2.99	3.48	4.02
Elaktothrix						
Eudorina						
Gloeobotrys						
Kichnerella						
Monoraphidium	84.09	13.13	6.46	10.37	13.40	13.40
Mougeotia						
Oocystis		17.86	2.05		7.56	4.77
Paulschulzia						
Pediastrum		18.81	23.01		65.00	70.00
Planctonema						
Pyramidomonas						
Quadrigula						
Scenedesmus			11.10			21.86
Schroederia						
Small greens	12.18			6.00		
Spirogrya						
Sponylosium						
Staurostrum						
Teilingia						
Tetraedon			0.15			3.42
Westella						
Desmidium						
Scourfieldia	0.54			5.23		
Gyromitus		8.66	12.99		10.48	20.96
Chlorogonium						
Total	202.24	85.60	68.85	123.04	146.99	165.35

GENERA	BIOMASS (mg-m ⁻³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 3						
Astasia		8.32			29.81	
Euglena		0.61		18.00	18.00	
Trachelomonas	4.27					
Phacus						
Total	4.27	8.93	0.00	18.00	47.81	0.00
GROUP 4						
Biocoeca		2.44			6.00	
Bitrichia						
Chrysochromulina	27.55	81.81	118.32	4.99	14.99	14.99
Chrysoikos						
Small Chrysophyceae	31.75	21.95	8.87	4.99	4.99	4.99
Large Chrysophyceae	30.11	5.47		8.99	8.99	
Dinobryon						
Kephyrion						
Mallomonas	9.67	40.90		38.42	39.27	
Ochromonas						
Pteridomonas						
Salpingoeca			7.31			12.00
Spinifiromonas						
Stelemonas	5.40			5.64		
Stichogloeca						
Synura						
Uroglena						
Epiphyxis						
Total	104.48	152.57	134.50	63.03	74.24	31.98
GROUP 5						
Asterionella	0.13	2.89	1.18	7.42	8.15	8.26
Cyclotella	96.80	26.76	15.10	25.43	25.43	29.06
Diatoma						
small Diatoms						
large Diatoms						
Fragilaria						
Frustula						
Gyrosigma						
Melosira		27.65	18.50		40.41	73.21
Navicula						
Nitzschia						
Rhizosolenia			5.92			9.23
Stephanodiscus						
Surirella						
Synedra	2.48	4.66	10.87	8.70	23.07	39.40
Tabellaria						
Stauroniscus						
Pennate Diatoms						
Total	99.41	61.96	51.57	41.55	97.06	159.16
GROUP 6						
Cryptomonas	89.26	62.87	97.02	55.73	55.73	41.92
Katablepharis	13.65	6.47	5.75	5.76	5.76	5.76
Rhodomonas	496.33	432.13	320.11	14.41	14.41	14.41
Gonyostomum						
Total	599.24	501.47	422.88	75.90	75.90	62.09
GROUP 7						
Ceratium						
Gymnodinium	10.29	4.89	3.43	32.00	36.00	32.00
Peridinium	5.42	9.24	1.11	16.76	58.76	17.42
Total	15.71	14.13	4.54	48.76	94.76	49.42

Appendix A5. Phytoplankton data from Split Lake, 1989

Group

1. Cyanophyceae - bluegreen
2. Chlorophyceae - greens
3. Euglenophyceae - euglenophytes
4. Chrysophyceae - chrysophytes
5. Bacillario phyceae - diatoms
6. Cryptophyceae - cryptophytes
7. Peridineae - dinoflagellates

SPLIT LAKE June 5 1989

GENERA	BIOMASS (mg-m ⁻³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 1						
Anabaena		2.94			30.39	
Aphanizomenon		0.25			13.39	
Aphanocapsa						
Aphanothece						
Chroococcus						
Gomphospaeria		1.12			22.00	
Lyngbya	27.59		36.09	9.71		10.62
Merismopedia						
Microcystis						
Oscillatoria	0.57			17.54		
Radiocystis						
Small bluegreens						
Synechococcus						
Marssoniella						
Total	28.16	4.31	36.09	27.25	65.78	10.62
GROUP 2						
Ankistrodesmus		2.51			6.94	
Ankrya						
Arthrodesmus						
Botryococcus						
Carteria						
Chlamydomonas		10.22	2.91		11.06	12.44
Chodatella		0.36			4.57	
Closterium			0.55			17.42
Coelastrum						
Collodictyon						
Cosmarium						
Crucigeniella						
Dictyosphaerium		0.37	0.80		2.92	2.99
Elaktothrix						
Eudorina						
Gloeobotrys						
Kichnerella						
Monoraphidium	2.60	3.60		10.63	9.56	
Mougeotia						
Oocystis						
Paulschulzia						
Pediastrum	10.19			46.00		
Planctonema						
Pyramidomonas						
Quadrigula						
Scenedesmus	9.02	18.05		13.39	13.39	
Schroederia						
Small greens						
Spirogrya						
Sponylosium						
Staurostrum						
Teilingia						
Tetraedon						
Westella						
Desmidium						
Scourfieldia						
Gyromitus		14.07	21.66		10.76	10.48
Chlorogonium						
Total	21.81	49.18	25.92	70.02	59.20	43.33

GENERA	BIOMASS (mg-m ⁻³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 3						
Astasia			3.82			33.16
Euglena			3.05			18.00
Trachelomonas	0.61	1.83		18.00	18.00	18.00
Phacus						
Total	0.61	1.83	6.87	18.00	18.00	51.16
GROUP 4						
Biocoeca		1.93	0.81		8.00	6.00
Bitrichia						
Chrysochromulina	93.48	106.55	43.23	14.99	14.99	14.51
Chrysoikos						
Small Chrysophyceae	21.38	8.87	30.35	4.51	4.99	4.99
Large Chrysophyceae	24.57	1.29	21.98	8.99	7.01	7.01
Dinobryon	36.51			11.74		
Kephyrion						
Mallomonas	8.93			32.66		
Ochromonas	8.94			8.41		
Pteridomonas						
Salpingoeca		5.68			6.00	
Spinifiromonas						
Stelixmonas	1.35	10.80	7.90	5.64	5.64	5.76
Stichogloeca						
Synura	6.50		3.61	12.00		9.86
Uroglena						
Epiphyxis						
Total	201.66	135.12	107.88	98.94	46.63	48.13
GROUP 5						
Asterionella	13.44	22.64	32.70	15.65	15.63	15.74
Cyclotella	14.37	13.66	47.83	7.26	29.06	29.07
Diatoma						
small Diatoms						
large Diatoms						
Fragilaria						
Frustula						
Gyrosigma						
Melosira	300.93	81.86	2963.27	121.55	115.89	134.52
Navicula						
Nitzschia						
Rhizosolenia	3.86	5.28	12.28	10.08	11.20	14.83
Stephanodiscus						
Surirella						
Synedra	7.79	8.42	8.35	23.18	23.07	19.67
Tabellaria	26.37	16.04	3.08	43.60	16.68	15.43
Stauroniscus						
Pennate Diatoms						
Total	366.76	147.90	3067.51	221.32	211.53	229.26
GROUP 6						
Cryptomonas	15.89	8.28	12.45	57.36	57.36	56.16
Katablepharis	15.80	6.47	8.62	5.76	5.76	5.76
Rhodomonas	110.74	104.91	166.86	13.42	14.41	14.17
Gonyostomum						
Total	142.43	119.66	187.93	76.54	77.53	76.09
GROUP 7						
Ceratium						
Gymnodinium			5.66			37.82
Peridinium	1.48		1.85	16.76		18.05
Total	1.48	0.00	7.51	16.76	0.00	55.87

SPLIT LAKE July 3 1989

GENERA	BIOMASS (mg-m ³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 1						
Anabaena	20.93	9.89	16.00	89.56	56.19	53.46
Aphanizomenon	0.63	3.01	0.25	10.62	13.39	13.39
Aphanocapsa						
Aphanothece						
Chroococcus						
Gomphospaeria		1.84			26.00	
Lyngbya	23.69	12.68	25.36	9.65	8.77	8.77
Merismopedia		3.22			4.75	
Microcystis						
Oscillatoria						
Radiocystis						
Small bluegreens						
Synechococcus						
Marssonella						
Total	45.25	30.64	41.61	109.83	109.10	75.62
GROUP 2						
Ankistrodesmus						
Ankrya						
Arthrodesmus						
Botryococcus						
Carteria						
Chlamydomonas	12.09	6.84	2.18	13.23	18.06	12.06
Chodatella	3.59	3.23	0.36	4.57	4.57	4.57
Closterium		0.08			9.10	
Coelastrum						
Collodictyon						
Cosmarium						
Crucigeniella						
Dictyosphaerium	18.49		11.38	3.98		3.98
Elaktothrix						
Eudorina						
Gloeobotrys						
Kichnerella						
Monoraphidium	9.90	5.88	2.33	9.79	16.48	5.37
Mougeotia						
Oocystis	1.24	14.51		4.35	14.79	
Paulschulzia						
Pediastrum			1.44			7.27
Planctonema	6.34			8.25		
Pyramidomonas						
Quadrigula						
Scenedesmus		11.55			11.54	
Schroederia						
Small greens						
Spirogrya						
Sponylosium						
Staurostrum						
Teilingia						
Tetraedon		1.22			6.87	
Westella						
Desmidium						
Scourfieldia						
Gyromitus		15.17			11.04	
Chlorogonium						
Gloeococcus		1.01	1.93		6.46	8.00
Total	51.65	59.49	19.62	44.17	92.45	33.25

GENERA	BIOMASS (mg·m ⁻³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 3						
Astasia						
Euglena		2.61			29.22	
Trachelomonas	4.88	7.33	3.66	18.00	18.00	18.00
Phacus						
Total	4.88	9.94	3.66	18.00	47.22	18.00
GROUP 4						
Biocoeca	1.93		1.93	8.00		8.00
Bitrichia						
Chrysochromulina	22.45	77.63	15.90	14.99	12.99	14.99
Chrysoikos						
Small Chrysophyceae	28.95	28.48	30.35	4.99	4.99	4.99
Large Chrysophyceae	3.88	7.76	24.63	7.01	7.01	8.99
Dinobryon			14.63			10.90
Kephyrion						
Mallomonas		0.54			17.31	
Ochromonas						
Pteridomonas						
Salpingoeca		9.05			7.01	
Spinifiromonas						
Stellexmonas	4.73	5.40		5.64	5.64	
Stichogloecca						
Synura			4.33			10.48
Uroglena						
Epiphyxis						
Total	61.94	128.86	91.77	40.63	54.95	58.35
GROUP 5						
Asterionella	6.83	2.45	8.11	15.24	15.53	15.35
Cyclotella	6.01	40.76	1.09	25.43	25.43	21.80
Diatoma						
small Diatoms						
large Diatoms						
Fragilaria	1.11			21.95		
Frustula						
Gyrosigma		6.43			39.46	
Melosira	102.49	31.62	469.99	79.06	117.05	129.27
Navicula						
Nitzschia						
Rhizosolenia	12.59			11.87		
Stephanodiscus						
Surirella						
Synedra	4.74	8.05	4.55	23.29	23.07	23.07
Tabellaria						
Stauronites						
Pennate Diatoms						
Total	133.77	89.31	483.74	176.84	220.54	189.49
GROUP 6						
Cryptomonas	25.56	56.05	15.20	56.57	57.36	34.62
Katablepharis	9.34	15.80	0.72	5.76	5.76	5.76
Rhodomonas	371.67	392.67	200.34	14.41	14.41	14.41
Gonyostomon						
Total	406.57	464.52	216.26	76.74	77.53	54.79
GROUP 7						
Ceratium						
Gymnodinium		3.61			9.86	
Peridinium	0.15	1.85	0.99	7.74	18.05	16.76
Total	0.15	5.46	0.99	7.74	27.91	16.76

SPLIT LAKE August 14 1989

GENERA	BIOMASS (mg-m ⁻³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 1						
Anabaena	4.46	29.75		34.93	63.35	
Aphanizomenon	52.78	6.53	0.13	66.94	10.62	10.62
Aphanocapsa						
Aphanothece						
Chroococcus						
Gomphospaeria	1.83	6.70		18.00	20.00	
Lyngbya	32.97	4.45	5.07	8.77	10.58	8.77
Merismopedia	33.69	34.66		6.35	6.35	
Microcystis						
Oscillatoria						
Radiocystis						
Small bluegreens						
Synechococcus						
Marssonella						
Total	125.73	82.09	5.20	134.99	110.90	19.39
GROUP 2						
Ankistrodesmus						
Ankrya						
Arthrodesmus						
Botryococcus						
Carteria						
Chlamydomonas	6.49	2.74	3.55	12.00	14.00	14.99
Chodatella						
Closterium	1.36	1.42		23.49	11.93	
Coelastrum	0.29	4.31		14.00	19.00	
Colodictyon						
Cosmarium						
Crucigeniella						
Dictyosphaerium	35.66	19.05		4.02	4.02	
Elaktothrix	0.53			4.13		
Eudorina						
Gloeobotrys						
Kichnerella						
Monoraphidium	14.88	21.74	1.34	14.97	13.40	10.13
Mougeotia						
Oocystis		5.63			4.75	
Paulschulzia						
Pediastrum		82.99			70.00	
Planctonema		3.10			9.37	
Pyramidomonas						
Quadrigula						
Scenedesmus	23.10	36.09		11.54	13.39	
Schroederia						
Small greens	1.58			7.49		
Spirogrya						
Sponylosium						
Staurastrum						
Teilingia						
Tetraedon						
Westella						
Desmidium						
Scourfieldia		5.03			6.94	
Gyromitus	142.95	90.97	151.62	10.48	10.48	10.48
Chlorogonium						
Gloeocystis	4.12			27.00		
Total	230.96	273.07	156.51	129.12	177.28	35.60

GENERA	BIOMASS (mg-m ³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 3						
Astasia						
Euglena	1.51			24.33		
Trachelomonas	153.53		14.65	18.00		18.00
Phacus						
Total	155.04	0.00	14.65	42.33	0.00	18.00
GROUP 4						
Biocoeca			0.81			6.00
Bitrichia						
Chrysochromulina	50.00	47.16	22.41	14.99	4.99	4.99
Chrysoikos						
Small Chrysophyceae	29.42	30.35	39.22	4.99	4.99	4.99
Large Chrysophyceae	19.16	27.37		8.99	8.99	
Dinobryon						
Kephyrion						
Mallomonas	0.54	4.34	3.38	17.31	17.31	26.41
Ochromonas						
Pteridomonas						
Salpingoeca						
Spinifiromonas						
Stelexmonas						
Stichogloeca						
Synura						
Uroglena						
Epiphyxis						
Total	99.12	109.22	65.82	46.28	36.28	42.39
GROUP 5						
Asterionella	0.17			7.41		
Cyclotella	18.71	10.82	13.69	29.06	29.06	29.06
Diatoma						
small Diatoms						
large Diatoms						
Fragilaria						
Frustula						
Gyrosigma						
Melosira		8.44	58.88		34.29	77.80
Navicula						
Nitzschia						
Rhizosolenia	19.51	9.74		10.90	10.90	
Stephanodiscus						
Surirella						
Synedra	4.02	9.48	0.57	22.80	8.71	8.43
Tabellaria						
Stauroniscus						
Pennate Diatoms						
Total	42.41	38.48	73.14	70.17	82.96	115.29
GROUP 6						
Cryptomonas	90.29	203.68	150.40	57.36	57.36	56.57
Katablepharis	12.21	10.78	6.47	5.76	5.76	5.76
Rhodomonas	487.24	510.40	180.89	14.41	14.41	14.41
Gonyostomum						
Total	589.74	724.86	337.76	77.53	77.53	76.74
GROUP 7						
Ceratium						
Gymnodinium						
Peridinium	1.11	0.49	1.11	17.42	16.76	17.42
Total	1.11	0.49	1.11	17.42	16.76	17.42

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GENERA	BIOMASS (mg-m ³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 1						
Anabaena	22.06	18.36		79.45	72.57	
Aphanizomenon	51.26	3.01	0.75	66.94	13.39	13.39
Aphanocapsa		1.08			6.59	
Aphanothece			3.23			6.59
Chroococcus						
Gomphospaeria	1.94	2.91		21.00	21.00	
Lyngbya	15.22		2.54	8.77		8.77
Merismopedia	14.44	17.26		6.35	5.54	
Microcystis						
Oscillatoria						
Radiocystis						
Small bluegreens						
Synechococcus						
Marssoniella						
Total	104.92	42.62	6.52	182.51	119.09	28.75
GROUP 2						
Ankistrodesmus						
Ankrya						
Arthrodesmus						
Botryococcus						
Carteria						
Chlamydomonas	8.26	21.76	6.94	20.20	24.54	16.94
Chodatella		0.36			4.57	
Closterium	0.58	1.48	0.53	24.36	35.09	11.94
Coelastrum	0.61	1.94		18.00	21.00	
Collodictyon						
Cosmarium						
Crucigeniella						
Dictyosphaerium	21.01	4.40		4.02	4.02	
Elaktothrix						
Eudorina						
Gloeobotrys						
Kichnerella						
Monoraphidium	28.18	21.87	8.28	9.27	13.40	6.50
Mougeotia		3.60			20.48	
Oocystis		1.21	11.10		4.31	16.48
Paulschulzia						
Pediastrum		13.77			71.00	
Planctonema						
Pyramidomonas						
Quadrigula						
Scenedesmus	20.49			22.04		
Schroederia						
Small greens						
Spirogrya						
Sponylosium						
Staurostrum	1.50			24.29		
Teilingia						
Tetraedon						
Westella						
Desmidium						
Scourfieldia						
Gyromitus	168.95	4.33	610.81	10.48	10.48	10.48
Chlorogonium	5.07			11.05		
Total	254.65	74.72	637.66	143.71	208.89	62.34

GENERA	BIOMASS (mg-m ³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 3						
Astasia			1.69			25.29
Euglena			1.83			18.00
Trachelomonas	4.27			18.00		18.00
Phacus						
Total	4.27	0.00	3.52	18.00	0.00	43.29
GROUP 4						
Biocoeca						
Bitrichia						
Chrysochromulina	15.88	67.05	29.53	4.99	13.98	14.99
Chrysoikos						
Small Chrysophyceae	37.82	17.28	20.55	4.99	4.99	4.99
Large Chrysophyceae	9.48	5.47		7.49	8.99	
Dinobryon						
Kephyrion		1.03			6.49	
Mallomonas	0.54	0.54	0.54	17.31	17.31	17.31
Ochromonas			6.85			12.21
Pteridomonas						
Salpingoeca						
Spinifiromonas						
Stelemonas	3.38		1.35	5.64		5.64
Stichogloece						
Synura						
Uroglena						
Epiphyxis						
Total	67.10	91.37	58.82	40.42	51.76	55.14
GROUP 5						
Asterionella	2.44	0.96	0.12	15.67	15.55	8.37
Cyclotella	20.21	10.68	37.26	29.06	18.17	25.43
Diatoma						
small Diatoms						
large Diatoms						
Fragilaria						
Frustula						
Gyrosigma						
Melosira	95.32	144.53	55.54	76.76	76.18	79.91
Navicula						
Nitzschia						
Rhizosolenia	10.97			14.29		
Stephanodiscus						
Surirella						
Synedra	22.11	3.89	0.98	39.67	22.80	11.58
Tabellaria		5.55			18.78	
Stauronemion						
Pennate Diatoms						
Total	151.05	165.61	93.90	175.45	151.48	125.29
GROUP 6						
Cryptomonas	100.04	77.03	82.30	55.28	56.86	56.98
Katablepharis	10.06	8.62	2.87	5.76	5.76	5.76
Rhodomonas	361.70	242.73	133.54	14.41	14.41	14.41
Gonyostomum						
Total	471.80	328.38	218.71	75.45	77.03	77.15
GROUP 7						
Ceratium						
Gymnodinium		6.75			12.15	
Peridinium	8.88	1.04	1.23	60.42	34.18	18.05
Total	8.88	7.79	1.23	60.42	46.33	18.05

Appendix A6. Phytoplankton data from Stephens Lake, 1989

Group

1. Cyanophyceae - bluegreen
2. Chlorophyceae - greens
3. Euglenophyceae - euglenophytes
4. Chrysophyceae - chrysophytes
5. Bacillario phyceae - diatoms
6. Cryptophyceae - cryptophytes
7. Peridineae - dinoflagellates

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GENERA	BIOMASS (mg-m ³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 1						
Anabaena						
Aphanizomenon	1.01	1.01		16.87	16.87	
Aphanocapsa						
Aphanothece						
Chroococcus						
Gomphospaeria		1.12			22.00	
Lyngbya	13.53	17.75	10.14	9.65	8.77	8.77
Merismopedia						
Microcystis						
Oscillatoria						
Radiocystis						
Small bluegreens						
Synechococcus						
Marssonella						
Total	14.54	19.88	10.14	26.52	47.64	8.77
GROUP 2						
Ankistrodesmus			7.36			6.25
Ankrya						
Arthrodesmus						
Botryococcus		7.76	8.98		42.00	35.00
Carteria	19.25			8.00		
Chlamydomonas	25.78		0.81	25.41		6.00
Chodatella						
Closterium			0.46			16.42
Coelastrum						
Collodictyon						
Cosmarium						
Crucigeniella						
Dictyosphaerium		10.75	0.25		4.02	4.06
Elaktothrix						
Eudorina						
Gloeobotrys						
Kichnerella						
Monoraphidium	8.33	2.80	3.35	6.52	4.99	11.00
Mougeotia						
Oocystis						
Paulschulzia			13.00			15.12
Pediastrum		12.00			58.00	
Planctonema						
Pyramidomonas						
Quadrigula						
Scenedesmus		15.79	2.01		12.80	8.12
Schroederia						
Small greens						
Spirogrya						
Sponylosium						
Staurastrum						
Teilingia						
Tetraedon						
Westella						
Desmidium						
Scourfieldia						
Gyromitus	43.32	30.30		10.48	11.03	
Chlorogonium						
Total	96.68	79.40	36.22	50.41	132.84	101.97

GENERA	BIOMASS (mg-m ⁻³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 3						
Astasia						
Euglena						
Trachelomonas		0.61	0.61		18.00	18.00
Phacus						
Total	0.00	0.61	0.61	0.00	18.00	18.00
GROUP 4						
Biocoeca						
Bitrichia						
Chrysochromulina	60.30	14.83	61.68	14.99	4.51	14.99
Chrysoikos	0.30			4.31		
Small Chrysophyceae	51.83	20.35	16.81	4.99	4.51	4.99
Large Chrysophyceae	145.07	12.93	13.69	8.99	7.01	8.99
Dinobryon		20.69			9.71	
Kephyrion						
Mallomonas		1.46			37.97	
Ochromonas						
Pteridomonas						
Salpingoeca	3.25	3.88	4.87	6.00	7.01	6.00
Spiniferomonas	0.81			6.00		
Stelemonas		14.86	28.41		5.64	6.00
Stichogloece						
Synura			4.33			10.48
Uroglena						
Epiphyxis						
Chrysosphaerella	9.00			30.60		
Total	270.56	89.00	129.79	75.88	76.36	51.45
GROUP 5						
Asterionella	13.49	24.00	6.50	15.25	15.31	15.39
Cyclotella	10.46	33.08	6.51	27.56	29.06	21.80
Diatoma						
small Diatoms						
large Diatoms						
Fragilaria		12.87			49.72	
Frustula						
Gyrosigma						
Melosira	3262.87	1040.05	741.90	132.36	131.75	126.08
Navicula						
Nitzschia						
Rhizosolenia		10.56	19.48		11.20	10.90
Stephanodiscus			2.25			27.81
Surirella						
Synedra	2.88	20.35	14.35	22.80	22.80	19.67
Tabellaria		2.04	0.61		14.80	14.29
Stauroniscus						
Pennate Diatoms						
Total	3289.70	1142.95	791.60	197.97	274.64	235.94
GROUP 6						
Cryptomonas	22.84	23.35	5.97	55.73	59.69	34.62
Katablepharis	25.98	7.90	7.18	7.56	5.76	5.76
Rhodomonas	482.20	172.06	113.87	14.65	14.41	14.17
Gonyostomum						
Total	531.02	203.31	127.02	77.94	79.86	54.55
GROUP 7						
Ceratium						
Gymnodinium	89.48	0.84	27.07	121.57	20.00	69.86
Peridinium	4.06	1.48	11.85	48.05	16.76	46.35
Total	93.54	2.32	38.92	169.62	36.76	116.21

STEPHENS LAKE July 3 1989

GENERA	BIOMASS (mg-m ⁻³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 1						
Anabaena	8.01	4.12	9.11	58.27	34.02	35.17
Aphanizomenon		1.26	1.80		13.39	13.50
Aphanocapsa						
Aphanothece						
Chroococcus						
Gomphospaeria						
Lyngbya	81.21	27.07	30.45	9.65	10.62	9.65
Merismopedia		1.12			4.21	
Microcystis						
Oscillatoria						
Radiocystis						
Small bluegreens						
Synechococcus						
Marssonella						
Total	89.22	33.57	41.36	67.92	62.24	58.32
GROUP 2						
Ankistrodesmus		4.07	1.29		4.94	4.86
Ankrya						
Arthrodesmus						
Botryococcus						
Carteria		3.76			10.00	
Chlamydomonas	2.74	10.99	22.03	14.00	26.23	19.29
Chodatella		2.87	2.16		4.57	9.14
Closterium						
Coelastrum		0.51			17.00	
Colodictyon						
Cosmarium						
Crucigeniella						
Dictyosphaerium		3.91	2.24		4.02	4.21
Elaktothrix						
Eudorina						
Gloeobotrys						
Kichnerella						
Monoraphidium	3.56	10.86	14.54	10.27	9.84	17.09
Mougeotia						
Oocystis		4.22	1.81		4.31	4.31
Paulschulzia						
Pediastrum		15.85	10.87		71.00	47.00
Planctonema						
Pyramidomonas						
Quadrigula						
Scenedesmus	7.90			12.80		
Schroederia						
Small greens						
Spirogrya						
Sponylosium						
Staurostrum						
Teilingia						
Tetraedon		0.15			3.42	
Westella						
Desmidium						
Scourfieldia						
Gyromitus			30.32			10.48
Chlorogonium						
Gloeococcus		0.80			2.99	
Total	14.20	57.99	85.26	37.07	158.32	116.38

GENERA	BIOMASS (mg-m ³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 3						
Astasia		3.06			30.79	
Euglena						
Trachelomonas	1.22	2.44	8.55	18.00	18.00	18.00
Phacus						
Total	1.22	5.50	8.55	18.00	48.79	18.00
GROUP 4						
Biocoeca			3.88			7.01
Bitrichia						
Chrysochromulina	60.39	15.41	26.70	13.98	4.99	14.99
Chrysoikos	0.30			4.31		
Small Chrysophyceae	31.29	23.81	28.95	4.99	4.99	4.99
Large Chrysophyceae	213.49	5.78	2.59	8.99	8.00	7.01
Dinobryon	267.96	40.43	10.56	43.03	11.54	11.20
Kephyrion		0.81			6.00	
Mallomonas						
Ochromonas						
Pteridomonas						
Salpingoeca	9.05		21.11	7.01		6.00
Spinifiromonas						
Stelemonas	5.40	6.08	8.78	5.64	5.64	5.64
Stichogloece						
Synura						
Uroglena	96.98	4.87	5.17	7.01	6.00	7.01
Epiphyxis						
Total	684.86	97.19	107.74	94.96	47.16	63.85
GROUP 5						
Asterionella	4.97	3.59	15.85	15.24	14.94	15.17
Cyclotella	6.34	27.39	13.83	20.53	25.43	25.43
Diatoma						
small Diatoms						
large Diatoms						
Fragilaria						
Frustula						
Gyrosigma						
Melosira		218.87	337.02		126.63	127.43
Navicula						
Nitzschia						
Rhizosolenia	5.48	5.80		11.34	11.56	
Stephanodiscus						
Surirella						
Synedra	1.82	4.35	5.07	22.80	23.07	22.80
Tabellaria						
Stauromies						
Pennate Diatoms						
Total	18.61	260.00	371.77	69.91	201.63	190.83
GROUP 6						
Cryptomonas	5.96	29.86	32.03	59.48	34.62	34.62
Katablepharis	9.34	10.78	7.90	5.76	5.76	5.76
Rhodomonas	62.63	306.04	113.58	14.41	14.65	14.41
Gonyostomon						
Total	77.93	346.68	153.51	79.65	55.03	54.79
GROUP 7						
Ceratium						
Gymnodinium	18.27		14.43	45.86		9.86
Peridinium	1.97	3.32		16.76	17.42	
Total	20.24	3.32	14.43	62.62	17.42	9.86

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GENERA	BIOMASS (mg-m ⁻³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 1						
Anabaena	335.03	39.83	39.84	64.16	64.10	60.28
Aphanizomenon	60.42	7.54	2.89	24.01	10.62	24.01
Aphanocapsa						
Aphanothece		5.93			8.07	
Chroococcus						
Gomphospaeria		3.88	5.79		21.00	24.00
Lyngbya	13.53	23.69		9.65	9.65	
Merismopedia		16.24	22.14		6.00	6.35
Microcystis						
Oscillatoria						
Radiocystis						
Small bluegreens						
Synechococcus						
Marssonella						
Total	408.98	97.11	70.66	97.82	119.44	114.64
GROUP 2						
Ankistrodesmus	4.47			8.41		
Ankrya						
Arthrodesmus						
Botryococcus	7.76	14.66	6.86	42.00	36.00	32.00
Carteria			11.27			10.00
Chlamydomonas		11.77	3.85		14.14	8.00
Chodatella						
Closterium		1.31	0.44		18.41	16.10
Coelastrum			3.68			26.00
Collodictyon						
Cosmarium						
Crucigeniella						
Dictyosphaerium		5.69	11.85		3.98	3.98
Elaktothrix	0.55			4.17		
Eudorina						
Gloeobotrys						
Kichnerella						
Monoraphidium	2.98	14.76	1.12	9.63	9.32	4.21
Mougeotia						
Oocystis	1.51	3.61	4.63	4.31	9.86	4.35
Paulschulzia	19.25		37.57	17.23		21.54
Pediastrum	15.91	53.53	11.22	37.00	61.00	59.99
Planctonema			4.32			8.31
Pyramidomonas						
Quadrigula						
Scenedesmus	7.21	17.33	27.28	9.86	11.54	19.17
Schroederia						
Small greens						
Spirogrya						
Sponylosium						
Staurostrum			4.00			26.73
Tellingia						
Tetraedon			1.21			6.86
Westella						
Desmidium						
Scourfieldia		0.98			6.40	
Gyromitus		95.30	86.64		10.48	10.48
Chlorogonium						
Gloeococcus		0.80			2.99	
Total	59.64	219.74	215.94	132.61	184.12	257.72

GENERA	BIOMASS (mg-m ⁻³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 3						
Astasia						
Euglena		3.30			31.58	
Trachelomonas	1.22	17.10	11.60	18.00	18.00	18.00
Phacus						
Total	1.22	20.40	11.60	18.00	49.58	18.00
GROUP 4						
Biocoeca		5.78	1.93		8.00	8.00
Bitrichia						
Chrysochromulina	53.83	24.68	25.75	14.99	13.98	14.99
Chrysoikos						
Small Chrysophyceae	11.67	43.43	35.96	4.99	4.99	4.99
Large Chrysophyceae	5.17	8.19	10.34	7.01	8.99	7.01
Dinobryon	12.99			12.00		
Kephyrion						
Mallomonas	3.56	3.09		40.35	37.97	
Ochromonas						
Pteridomonas						
Salpingoeca	5.68	3.25		6.00	6.00	
Spinifiromonas						
Stelemonas	5.06		10.13	5.52		5.64
Stichogloece						
Synura						
Uroglena	8.93			6.00		
Epiphyxis						
Total	106.89	88.42	84.11	96.86	79.93	40.63
GROUP 5						
Asterionella	5.97			15.17		
Cyclotella	4.75	14.70	31.97	25.43	23.61	25.43
Diatoma						
small Diatoms						
large Diatoms						
Fragilaria						
Frustula						
Gyrosigma						
Melosira	6.28	3.17	43.55	39.15	24.73	67.01
Navicula						
Nitzschia						
Rhizosolenia	8.52	34.08		10.42	10.42	
Stephanodiscus						
Surirella						
Synedra	1.51	4.08	5.02	8.43	8.43	8.43
Tabellaria						
Stauronites						
Pennate Diatoms						
Total	27.03	56.03	80.54	98.60	67.19	100.87
GROUP 6						
Cryptomonas	107.07	88.83	125.01	57.36	80.14	55.28
Katablepharis	14.37	13.65	19.40	5.76	5.76	5.76
Rhodomonas	184.16	242.00	506.16	14.41	14.41	14.17
Gonyostomum						
Total	305.60	344.48	650.57	77.53	100.31	75.21
GROUP 7						
Ceratium	11.74		10.46	48.22		46.39
Gymnodinium						
Peridinium		2.77	5.54		17.42	59.59
Total	11.74	2.77	16.00	48.22	17.42	105.98

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GENERA	BIOMASS (mg-m ³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 1						
Anabaena	24.88			56.94		
Aphanizomenon	60.52	2.63	2.00	74.74	24.01	24.01
Aphanocapsa	5.39			7.82		
Aphanothece						
Chroococcus						
Gomphospaeria	6.70	13.03	1.68	20.00	24.00	20.00
Lyngbya	22.56	10.15	4.51	10.62	9.65	10.62
Merismopedia		16.37	48.13		6.35	6.35
Microcystis						
Oscillatoria						
Radiocystis						
Small bluegreens						
Synechococcus						
Marssoniiella						
Total	120.05	42.18	56.32	170.12	64.01	60.98
GROUP 2						
Ankistrodesmus	4.70			5.93		
Ankrya						
Arthrodesmus						
Botryococcus	9.77			36.00		
Carteria						
Chlamydomonas	0.81	10.57	25.74	6.00	24.79	22.44
Chodatella			1.80			4.57
Closterium		0.65	0.24		18.34	13.19
Coelastrum						
Collodictyon						
Cosmarium						
Crucigeniella						
Dictyosphaerium		6.74	22.28		2.99	3.98
Elaktothrix						
Eudorina						
Gloeobotrys						
Kichnerella						
Monoraphidium		8.94	14.95		10.22	14.26
Mougeotia						
Oocystis	0.60	4.02	3.09	4.31	4.35	4.35
Paulschulzia						
Pediastrum		28.63	21.99		45.00	66.00
Planctonema						
Pyramidomonas						
Quadrigula						
Scenedesmus			30.45			13.92
Schroederia						
Small greens			1.58			7.49
Spirogrya						
Sponylosium						
Staurostrum						
Teilingia						
Tetraedon						
Westella						
Desmidium						
Scourfieldia		1.21			5.43	
Gyromitus		181.94	121.21		10.48	11.03
Chlorogonium						
Gloeococcus	1.01			2.99		
Total	16.89	242.70	243.33	55.23	121.60	161.23

GENERA	BIOMASS (mg-m ³)			ESD		
	Stn. 1	Stn. 2	Stn. 3	Stn. 1	Stn. 2	Stn. 3
GROUP 3						
Astasia						
Euglena						
Trachelomonas		6.72	3.66		18.00	18.00
Phacus						
Total	0.00	6.72	3.66	0.00	18.00	18.00
GROUP 4						
Biocoeca						
Bitrichia						
Chrysochromulina	26.15	9.34	35.96	4.99	4.99	4.99
Chrysoikos						
Small Chrysophyceae	6.54	13.54	33.62	4.99	4.99	4.99
Large Chrysophyceae						
Dinobryon		3.00			30.60	
Kephyrion	0.81			6.00		
Mallomonas		1.09	1.09		17.31	17.31
Ochromonas						
Pteridomonas						
Salpingoeca	33.28			6.00		
Spinifiromonas						
Stelemonas			14.37			5.76
Stichogloecca						
Synura						
Uroglena						
Epiphyxis						
Total	66.78	26.97	85.04	21.98	57.89	33.05
GROUP 5						
Asterionella	93.29	1.51	1.27	15.72	8.11	15.53
Cyclotella		26.31	23.34		29.06	25.43
Diatoma						
small Diatoms						
large Diatoms						
Fragilaria						
Frustula						
Gyrosigma	5.09			36.49		
Melosira	75.39	148.94	35.01	64.03	74.12	67.52
Navicula						
Nitzschia						
Rhizosolenia	18.88		9.74	11.87		10.90
Stephanodiscus						
Surirella						
Synedra	2.65	0.93	3.66	23.20	14.37	23.07
Tabellaria		2.15			8.71	
Stauronemion						
Pennate Diatoms						
Total	195.30	179.84	73.02	151.31	134.37	142.45
GROUP 6						
Cryptomonas	65.08	106.61	121.72	80.14	55.28	60.66
Katablepharis	11.49	4.31	5.03	5.76	5.76	5.76
Rhodomonas	154.21	306.05	239.61	14.41	14.65	14.41
Gonyostomum						
Total	230.78	416.97	366.36	100.31	75.69	80.83
GROUP 7						
Ceratium	11.55			47.95		
Gymnodinium						
Peridinium		7.19	0.49		56.76	16.76
Total	11.55	7.19	0.49	47.95	56.76	16.76

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Appendix B1. List of Manitoba Department of Natural Resources Fisheries Branch reports written to date on data collected from the Churchill River Diversion and Nelson River under the Northern Flood Agreement Claim numbers 12 and 18. Documents are listed in chronological order of publication.



Appendix B1. List of Manitoba Department of Natural Resources Fisheries Branch reports written to date on data collected from the Churchill River Diversion and Nelson River under the Northern Flood Agreement Claim numbers 12 and 18. Documents are listed in chronological order of publication.

Year	Title
1984	Patalas, J.W. 1984. Fish population data from Sipiwesk, Split and Stephens lakes, 1983. Man. Dept. Nat. Res. Fish. Br. MS Report No. 84-24, 66pp.
	_____. 1984. Fish population data from Notigi, Wapisu, Threepoint and Footprint lakes, 1983. Man. Dept. Nat. Res. Fish. Br. MS Report No. 84-25, 70pp.
1986	Derksen, A.J. 1986. Ecological Monitoring - Fisheries 1985 Progress Report. Man. Dept. Nat. Res. Fish. Br. April 9, 1986. 43pp.
	Kirton, J.A.W. 1986. Fish population data from Rat, Karsakuwigamak, and West and Central Mynarski lakes, 1984. Man. Dept. Nat. Res. Fish. Br. MS Report No. 86-03, 48pp.
	_____. 1986. Fish population data from Split and Stephens lakes, 1984. Man. Dept. Nat. Res. Fish. Br. MS Report No. 86-04, 61pp.
	Green, D.J. 1986. Summary of Fish mercury data collected from lakes on the Rat-Burntwood and Nelson River systems, 1983-1985. Man. Dept. Nat. Res. MS Report No. 86-06, 359 pp.
	Mohr, L.C. and J.A.W. Kirton. 1986. Fish population data from Sipiwesk and Cross lakes, 1985. Man. Dept. Nat. Res. Fish. Br. MS Report No. 86-28, 83pp.
1987	Sopuck, R. D. 1987. A study of lake sturgeon (<u>Acipenser fulvescens</u>) in the Sipiwesk Lake area of the Nelson River, Manitoba, 1976-1978. Man. Dept. Nat. Res., Fish. Br. MS Report No. 87-2, 59pp.
	Hagenson, I. 1987. Fish population data from Rat and Split lakes, 1985. Man. Dept. Nat. Res. Fish. Br. MS Report No. 87-04, 59pp.
	Kirton, J.A.W. 1987. Fish population data from Macheewin, Osik, Footprint and Threepoint lakes, 1984. Man. Dept. Nat. Res. Fish. Br. MS Report No. 87-06, 78pp.

Appendix B1, continued.

Year	Title
1987	Green, D.J. 1987. Summary of fish population data from Rat and Threepoint lakes, 1986. Man. Dept. Nat. Res. Fish. Br. MS. Report No. 87-07, 47pp.
	Kirton, J.A.W. and L.C. Mohr. 1987. Fish population data from Wuskwatim and Apussigamasi lakes, 1984. Man. Dept. Nat. Res. Fish. Br. MS Report No. 87-08, 44pp.
	Sopuck, R.D. 1987. An analysis of changes in the Pipestone Lake fish community from 1980 to 1986. Man. Dept. Nat. Res., Fish. Br. MS Report No. 87-11, 59pp & Appendices.
	Livingston, L. 1987. A checklist of phytoplankton genera for Nelson River and Rat-Burntwood lakes, 1980, 1981 and 1986. Man. Dept. Nat. Res. Fish. Br. MS Report No. 87-14, 20pp.
	Hagenson, I. 1987. Fish population data from Split and Stephens lakes, 1986. Man. Dept. Nat. Res. Fish. Br. MS Report No. 87-26, 59pp.
	Green, D.J. 1987. Summary of fish population data collected from eight lakes on the Rat-Burntwood River System, 1985. Man. Dept. Nat. Res. Fish. Br. MS Report No. 87-27, 130pp.
	Mohr, L. 1987. Fish population data from Sipiwesk and Cross lakes, 1986. Man. Dept. Nat. Res. Fish. Br. MS Report No. 87-28, 87pp.
	Anonymous. 1987. A manual for ecological monitoring - data collection procedures. Man. Dept. Nat. Res. Fish. Br. June, 1987.
	Mohr, L. and Livingston, L. 1987. Ecological monitoring zooplankton analysis methodology for 1986/87. Man. Dept. Nat. Res. Fish. Br. June, 1987.
	Derksen, A.J. and D.J. Green. Total mercury concentrations in large fishes from lakes on the Churchill River Diversion and Nelson River. Canada-Manitoba Agreement on the Study and Monitoring of Mercury in Churchill River Diversion. Tech. Appendices to Summary Report Volume 4, paper no. 17.

Appendix B1, continued.

Year	Title
1988	Derksen, A.J. et.al. 1988. Ecological Monitoring - Fisheries 1986 Progress Report. Man. Dept. Nat. Res., Fish. Br. March, 1988.
	Livingston, L. 1988. Summary of phytoplankton data for the Nelson River and Rat-Burntwood lakes, 1987. Man. Dept. Nat. Res. Fish. Br. MS Report No. 88-04, 164pp.
	Green, D.J. 1988. Summary of fish population data from Rat and Threepoint lakes, 1987. Man. Dept. Nat. Res. Fish. Br. MS. Report No. 88-11, 55pp.
	_____. 1988. Summary of fish population data from Sipiwesk and Cross lakes, 1987. Man. Dept. Nat. Res. Fish. Br. MS Report No. 88-12, 90pp.
	Patalas, J.W. 1988. The effects of commercial fishing on lake sturgeon (<i>Acipenser fulvescens</i>) populations in the Sipiwesk Lake area of the Nelson River, Manitoba, 1987-1988. Man. Dept. Nat. Res. Fish. Br. MS Report No. 88-14, 38pp.
	Hagenson, I. 1988. Fish population data from Split and Stephens lakes, 1987. Man. Dept. Nat. Res. Fish. Br. MS Report No. 88-15, 66pp.
1989	Green, D.J. 1989. Summary of fish population data from Sipiwesk and Cross lakes, 1988. Man. Dept. Nat. Res. Fish. Br. MS. Report No. 89-11, 91pp.
	Livingston, L.R. 1989. Summary of phytoplankton data for the Nelson River and Rat-Burntwood lakes, 1988. Man. Dept. Nat. Res. Fish. Br. MS Report No. 89-07, 81pp.
	Green, D. J. 1989. Summary of fish population data from Sipiwesk and Cross lakes, 1988. Man. Dept. Nat. Res. Fish. Br. MS Report No. 89-11, 91pp.
	Green, D.J. 1989. Summary of fish population data from Rat and Threepoint lakes, 1988. Man. Dept. Nat. Res. Fish. Br. MS Report No. 89-13, 69pp.

Appendix B1, continued.

Year	Title
1989	Cherepak, B. C. 1989. The post-flood morphometry and bathymetry of Rat and Threepoint lakes, 1988. Man. Dept. Nat. Res. Fish. Br. MS Report No. 89-14.
	Ramsey, D. J. et al. 1989. Evolution of limnological conditions in lakes of the Nelson and Rat-Burntwood river systems after Churchill River diversion and Lake Winnipeg regulation: I. An Overview. Man. Dept. Nat. Res. Fish. Br. MS Report No. 89-15.
	Hagenson, I. 1989. Fish population data from Split and Stephens lakes, 1988. Man. Dept. Nat. Res. Fish. Br. MS Report No. 89-16.
1990	Green, D. J. 1990. Summary of fish population data from Rat and Threepoint lakes, 1989. Man. Dept. Nat. Res. Fish. Br. MS. Report No. 90-05.
	Green, D. J. 1990. Summary of fish population data from Sipiwesk and Cross lakes, 1989. Man. Dept. Nat. Res., Fish. Br. MS. Report No. 90-06.
	Hagenson, I. 1990. Fish popualtion data from Split and Stephens lakes, 1989. Man. Dept. Nat. Res., Fish. Br. MS. Report No. 90-07.
	Cherepak, B.C. 1990. The post-flood morphometry and bathymetry of Split and Stephens lakes, 1989. Man. Dept. Nat. Res., Fish. Br. MS Report No. 90-08.
	Janusz, L. 1990. Summary of net plankton data for the Nelson River and Rat-Burntwood lakes, 1987-89. Man. Dept. Nat. Res., Fish. Br. MS Report No. 90-09.
	Green, D.J. 1990. Updated summary of fish mercury data collected from six lakes on the Rat-Burntwood and Nelson River systems, 1983-1989. Man. Dept. Nat. Res., Fish. Br. MS Report No. 90-10.
	Janusz, L. 1990. Summary of zooplankton data for the Nelson River and Rat-Burntwood lakes, 1986-89. Man. Dept. Nat. Res., Fish. Br. MS Report No. 90-11.